National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

UNIVERSITY OF ALBERTA

A DESCRIPTIVE STUDY OF TECHNICAL AND VOCATIONAL TRAINING IN THE CANADIAN FORCES TO 1992

BY

LESLIE EDMUND CHAMP

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF EDUCATION

IN

VOCATIONAL EDUCATION

DEPARTMENT OF ADULT, CAREER AND TECHNOLOGY EDUCATION

EDMONTON, ALBERTA
SPRING, 1993

National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-82065-9

Canadä

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: LESLIE EDMUND CHAMP

TITLE OF THESIS: A DESCRIPTIVE STUDY OF TECHNICAL AND VOCATIONAL TRAINING IN THE CANADIAN FORCES TO 1992

DEGREE: MASTER OF EDUCATION

YEAR DEGREE GRANTED: 1993

Permission is hereby granted to the UNIVERSITY OF ALBERTA LIBRARY to reproduce single copies of the thesis and to lend or to sell such copies for private, scholarly, or scientific research purposes only.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

(Signed) L. E. Champ.

Permanent Address:
31 Erin Cres. S.E.
Calgary, Alberta
T2B 3C8

Date: March 25, 1993

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

THE UNDERSIGNED CERTIFY THAT THEY HAVE READ, AND RECOMMEND TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH FOR ACCEPTANCE, A THESIS ENTITLED **A DESCRIPTIVE STUDY OF TECHNICAL AND VOCATIONAL TRAINING IN THE CANADIAN FORCES TO 1992** SUBMITTED BY LESLIE EDMUND CHAMP. IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION IN VOCATIONAL EDUCATION.

Darius R. Young

Dr. D.R. Young, Supervisor

Dr. D.A. MacKay

A K Deane

Prof. A.K. Deane

Date: March 25, 1993

DEDICATION

I would like to dedicate this thesis to my parents, Leslie B. and Jean K. Champ and to my children, Leslie, Sarah, Robert and Emily.

ABSTRACT

This research entitled **A Descriptive Study of Technical and Vocational Training in the Canadian Forces to 1992** examined the origins of technical and vocational training of military personnel in the Canadian Forces from Confederation to the current time. This study concentrates on chronicling the events leading to the establishment of the Canadian military with emphasis on how the military trains its own personnel to maintain their infrastructure with minimum dependance upon the civilian sector.

Data was collected through a variety of sources such as unclassified military research and technical papers, conference papers, occupation trades specification papers, and interviews with serving members of the Canadian Forces. Other sources included the standard regimental histories, compliations of Canadian military history, and military periodicals.

This study traced the beginning of technical and vocational training in the Canadian military to the point where the military infrastructure has a higher percentage of personnel employed in occupational trades than in Combat Arms.

Recommendations for further study include the joint cooperation of the Canadian Forces and post-secondary institutions in making data available to researchers by the relaxing of security classifications on documents and the central collection of received data.

ACKNOWLEDGEMENTS

I wish to acknowledge the guidance and assistance of Dr. Darius Young, thesis advisor, through all phases of this report.

An appreciation must also be extended to Ms. Brenda Kwasnie, English Department Head at Forest Lawn High School, for her assistance in the proofreading and editing of the numerous drafts of this descriptive study.

A special acknowledgement is extended to Major George Ellis C.D. of the 14th Service Battalion for his interest in this study and for the many hours of conversation we spent on military topics.

TABLE OF CONTENTS

CHAPTER I: THE PROBLEM 1

INTRODUCTION 1

PURPOSE OF THE STUDY 5

SUPPORTING OBJECTIVES 6

LIMITATIONS 6

ASSUMPTIONS 8

JUSTIFICATION OF THE STUDY 8

REVIEW OF THE LITERATURE 9

DEFINITION OF TERMS 13

CANADIAN MILITARY 13

CAREER FIELD 14

TRADE (MILITARY) 14

TECHNICIAN 14

DATA COLLECTION 15

INSTRUMENTATION 15

POPULATION FOR INTERVIEW 16

ORGANIZATION OF REMAINING CHAPTERS 17

CHAPTER 11: REVIEW OF RELATED LITERATURE 18

INTRODUCTION 18

DATA BASE AND BIBLIOGRAPHICAL SEARCH 18

DISSERTATIONS AND THESES 20

CANADIAN FORCES PERSONNEL APPLIED RESEARCH UNIT . 20

SOCIO-DEMOGRAPHICS TRENDS 22

QUALITY OF RECRUIT APPLICANTS 24
RECRUITING PROCEDURES 26
MILITARY PUBLICATIONS 28
SECONDARY MILITARY SOURCES 29
NICHOLSON 35
JOHNSTON 36
RANNIE 38
HARRIS 39
MILITARY PERSONNEL INTERVIEWS 42
SUMMARY 46
CHAPTER III: OVERVIEW OF TECHNICAL AND VOCATIONAL TRAINING TO 1914 48
INTRODUCTION 48
THE BRITISH NORTH AMERICAN ACT (1867) 48
RELUCTANT RESPONSIBILITY 49
MAINTAINING THE BRITISH AND TRADITIONS 49
THE DECLINE OF EMPIRE 52
THE INPUT OF CITIZEN VOLUNTEER UNITS 55
MILITIA ACT (1868) 58
METIS INSURRECTION (1870) 59
CONTINUED NEGLECT OF MILITARY 60
THE NORTH WEST REBELLION (1885) 61
CANADIAN MILITARY MEDICAL SERVICES TO 1885 . . 65
CANADIAN MILITARY MEDICAL SERVICES TO 1914 . . 69
MILITARY ENGINEERS 74
VOCATIONAL IMPORTANCE OF PIONEERS & SIGNALS COMPANY 75
SUMMARY 78

CHAPTER IV: OVERVIEW OF TECHNICAL AND VOCATIONAL TRAINING TO 1968 81
  INTRODUCTION 81
  GENERAL OVERVIEW 81
  CANADIAN ARMY DENTAL CORPS 84
  CANADIAN OVERSEAS RAILWAY CONSTRUCTION CORPS . . 86
  CANADIAN FORESTRY CORPS 87
  ROYAL CANADIAN ORDNANCE CORPS (RCOC) 89
    RCEME SCHOOL 96
    APPRENTICE TRAINING PLAN 97
  THE KHAKI UNIVERSITY AND EDUCATIONAL UPGRADING . 99
  POST SECOND WORLD WAR 103
    TRADES TRAINING OVERSEAS 103
    EDUCATIONAL TRAINING IN CANADA 106
  CANADIAN POSTAL CORPS 108
  CANADIAN ARMY EDUCATION 108
    THE KHAKI COLLEGIATE 112
    VOCATIONAL TRAINING 115
  LONGUE POINTE ORDNANCE DEPOT TRAINING 116
  SUMMARY 117

CHAPTER V: CURRENT TECHNICAL AND VOCATIONAL TRAINING 120
  INTRODUCTION 120
  GENERAL OVERVIEW 120
  POST WAR EDUCATIONAL SOCIO-DEMOGRAPHICS . . . 122
  CRITICAL TRENDS AND IMPLICATIONS 126
  CANADIAN FORCES MILITARY TRADES CLUSTERS . . . 130
  THE CANADIAN FORCES CAREER INFORMATION SYSTEM . 131

THE ORIENTATION VIDEO 133

THE AUTOMATED COUNSELLING/DATA PROCESSING FACILITY 133

TRADE AND LIFESTYLE VIDEOTAPES 134

PRINTED TRADE BRIEFS 135

CANADIAN FORCES TRAINING SYSTEM 135

ADAPTIVE PROGRAMMES 138

LAND OPERATIONS TRADE REASSIGNMENT PROGRAMME 139

SKILLED TRADES ENTRY PLAN 141

PERFORMANCE ORIENTED ELECTRONICS TRAINING . 143

SELECTED MILITARY OCCUPATIONS 146

RADIO TECHNICIAN (221) 146

TERMINAL EQUIPMENT TECHNICIAN (222) . . . 148

TELETYPE AND CIPHER TECHNICIAN (223) . . . 149

RADAR TECHNICIAN (231) 150

ELECTRO-MECHANICAL TECHNICIAN (431) . . . 150

MILITARY TRADE OCCUPATIONS (VOCATIONAL) . . . 151

LINEMAN (052) 152

AIR TRAFFIC CONTROL ASSISTANT (162) . . . 153

MATERIALS TECHNICIAN (441) 154

FIRE FIGHTER (651) 156

MEDICAL ASSISTANT (711) 157

COOKS (861) 158

POSTAL CLERK (881) 158

SUMMARY 159

CHAPTER Vl: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY 162
INTRODUCTION 162
SUMMARY 162
CONCLUSIONS 167
RECOMMENDATIONS FOR FURTHER STUDY 170

BIBLIOGRAPHY 173
REFERENCES 173
CANADIAN ARMED FORCES PUBLICATIONS 176
PERIODICALS 179
THESES 180
PERSONAL INTERVIEWS 180

APPENDICES 181
APPENDIX A 181
APPENDIX B 184
APPENDIX C 186
APPENDIX D 188
APPENDIX E 197

TABLES . . . .

WAR ESTABLISHMENT OF VARIOUS UNITS (1914) . . . 77

ORDER OF PRECEDENCE: CANADIAN ARMY (1944) . . 82

ORDER OF PRECEDENCE: CANADIAN ARMY (1964) . . 83

TRADES TRAINING OVERSEAS (1945) 105

INSTRUCTORS' RATINGS OF POET STUDENTS (1984) . . 145

FIGURES . . . .

CANADIAN FORCES CAREER MOVEMENT THROUGH ADAPTIVE PROGRAMS 140

CHAPTER I

THE PROBLEM

INTRODUCTION

Necessity in warfare has demanded that any significant functioning body of military personnel be self-sufficient in most aspects of self preservation. The nature of this "violent contact between similar entities" (Wright, 1965, p. 8) requires military personnel to be able to maintain their weapons and to provide minor technical repairs to vital machinery in the areas of operations. The simulated nature of a peace time environment requires military personnel to reflect upon, to make improvement to military lessons learned in the past and to provide technical and occupational training to its personnel in order to maintain the infrastructure.

In order to maintain a high level of combat readiness in the advent of hostilities, a military force must also have a highly trained cadre of personnel in all areas of supply and services. A constant training of technical and vocational skills must become a priority of any military organization in order to meet the demands of a technical age.

Prior to the technical advances, particularly with regards to transportation and communication which dominate the latter half of the nineteenth century, the Canadian military inherited from their British military traditions the limited viewpoint of training personnel solely for combat oriented employment. The British navy was the one exception with the majority of their personnel involved in the operation and maintenance of coal-fired, steam-powered ships which required technical training for effective operation and maintenance. In the land element of the military structure, concentration was upon drills and maneuvers designed during the European wars of the early nineteenth century.

The Canadian military organization views itself as a professional organization in the same light as the medical, legal, engineering and education professions view themselves as professional organizations. From the time of Confederation (1867) to the outbreak of the Second World War (1939-1945), the Canadian military was engulfed in political and social maneuvers to establish itself and to be recognized as a professional organization. Various factors delayed this recognition; the political climate was unfavourable, the social environment unsympathetic. There was a succession of Ministers of Militia and Defence more interested in

> party politics than in organizing an effective military profession. After all, Canadians believed that they had few political enemies, that the militia had chased the Fenians away in 1866 and 1870, and had effectively terminated the North West Rebellion in 1885. In addition, there was the belief and the assurances that given the worst scenario, the Dominion of Canada could always rely upon the British army and navy (Harris, 1988, p. 6).

Slowly, over a period of time, this naive viewpoint of the role of a military organization began to change in Canadian political circles. The move to produce a professional organization was only effective when the organization began to regulate technical and vocational training of its personnel. Within the meaning of professionalism (Harris, p. 3) was the important attribute of expertise. Expertise is defined as "specialized knowledge and skills learned through study and practice and capable of being tested according to universal standards" (Harris, p. 3).

Two notions of expertise, in general terms, must be examined before the purpose of this research is provided. The first notion is of the military structure in general. Any profession, of which the military is a part, has a monopoly over the specialized knowledge and skills involved in performing its tasks. This would suggest that the military would have a certain independence from external influences. The nature of this profession demands that it be independent in order to complete in a satisfactory manner any given roles by the Canadian government. This nature would also dictate that it be self-sufficient in terms of maintenance and operation in its technical systems and not be dependent upon civilian workers with technological or vocational skills. In order to achieve this independence from the civilian sector, the Canadian military is forced by necessity and reinforced by its own desire, to train all of its personnel in all required technical and vocational aspects.

The second notion of specialized knowledge is a direct result of the majority of years the Canadian military has spent in a peacetime environment. Technical and vocational training do not cease when active hostilities are terminated. It is at this point that increased technical and vocational training would advance in order to maintain the military's readiness for future hostile military actions through constant training and preparation.

The majority of military personnel who resigned or retired from the Canadian military in the post Second World War years found their training in the peacetime environment to be of little value in obtaining civilian employment. Yee (1977) states that this situation reflected the "presence of combat oriented personnel skilled in military occupation structures which had no civilian counterpart" (p. 1). One reason for this denial of civilian counterparts in terms of technical or vocational skills was that time spent in military training was not accepted in trades which required apprenticeship papers.

This concept began to change in the 1960's when the Canadian economic sector experienced a technological growth which also affected the esoteric military occupations. Because of these technical developments, the Canadian Forces had to develop highly "sensitive weapon systems which generated additional requirements for technological skilled personnel" (Yee, p. 1). As the civilian education system had not yet caught up in terms of graduating qualified technicians, the military began to train their recruits, many of whom had not completed secondary education. The skills developed from these military technical occupations were in great demand by the civilian sector which could offer higher wages and better working conditions. It was not until the 1970's that Canada developed an extensive network for post-secondary training. The major growth has been in the "non-degree vocationally oriented community college system which offers training in technical and administrative service occupations" (Cotton, 1980, p. 36). The result was that military technical training no longer "articulated with the Canadian educational system, but competed against it" (Cotton, p. 36). This led to policy changes by the Canadian Forces to maintain skilled technicians through more trade occupation training. This improved technical and occupation training for military personnel was conducted in the knowledge that the "majority of eligible civilians for recruitment were in the better educated category but that the majority of recruits came from the less educated category of society" (Cotton, p. 38).

PURPOSE OF THE STUDY

The purpose of this research is to document and to analyze through a descriptive study the procedures used by the Canadian military to provide technical and vocational training to their personnel.

SUPPORTING OBJECTIVES

The following objectives were used to support the major purpose of this study:

To identify the origins and evolution of technical and vocational training in the Canadian military organization from the Militia Act 1855 to the present.

To examine the current procedures used in obtaining and training military personnel for technical and vocational occupations in order to maintain its standards of expertise and professionalism.

To document the extensive requirements for occupational training conducted by the Canadian military in order to maintain its infrastructure as a self-reliant organization.

LIMITATIONS

This research will be limited to examining the technical and vocational training that is conducted in the land element of the Canadian Forces, excluding the Militia.

This study will be severely limited by the quantity of information that will be released to the researcher by the Canadian Forces. The Canadian Forces has a government approved classification system which ranges from classified to degrees of secrecy which restricts all access to information, whether it is in verbal, written, oral, or photographic forms. The only information available to researchers is that which has been declared unclassified. This, in turn, decreases the availability of information.

The third limitation which is common to descriptive research due to the heavy utilization of bibliographical materials is the bias imposed, either consciously or unconsciously, by both the author of the materials or the researcher. There is a naive tendency to accept written materials at face value. As a warning to potential researchers Van Dalen (1962) states:

> Printed and written materials are not necessarily accurate. Sometimes clerks make errors in recording information; committee members conceal their real convictions when writing reports; official records are altered or slanted to give a better picture of conditions than actually existed;... (p. 194).

Particular attention must be given by the researcher in the review or analysis of military programs or technical reports by considering what Popham observes with regards to limitations imposed upon such reports in advance by those who sponsor the programs or reports:

> The scout's motto, "Be Prepared" should be adhered to by all acute evaluators....Vested interests are everywhere. Vested interests are powerful. Vested interests have to be identified in advance.... Not to do so would be foolish (Popham, 1988, p. 315).

Lastly, this research is restricted by the availability of resources. The lack of earlier research into this particular area of interest forces the researcher to rely heavily upon secondary materials which in many cases do not refer directly to the area of research. In order to analysis the measurement or lack of measurement from these sources, the researcher must be able to "read between the lines" in order to link together information which either is not considered important or is taken for granted by the authors.

ASSUMPTIONS

A number of assumptions have been made that specifically apply to this descriptive study.

This research will assume that any documents, reports, evaluations, pamphlets and other materials obtained by the researcher from the Canadian Forces will be accurate in information and free of any misinformation in order to protect perceived security classifications.

It will be also be assumed that the sources of information and any references chosen for this study are, as much as possible, free of author bias and that sources quoted by these authors are cited accurately.

JUSTIFICATION FOR THE STUDY

It must be accepted that the military organization in Canada is a complex social institution. As stated by Major Cotton (1979) "no one researcher or team of researchers could fully depict its character. One is constrained to simplify issues..." (p. 6). A review of standard military references and data with regards to the technical and vocational training of its personnel reveals a serious lack of information. When one considers the amount of time and effort, not to mention financial expense, the Canadian Forces place on technical and vocational training for its personnel in order to maintain a closed environment, it appears interesting that a research void would exist. There are numerous references and sources on how the military trains its officers; there is little information on how the other ranks are trained for the day to day operations in a peacetime environment. Even though there is a myriad of audio-visual and printed sources dealing with many aspects of the Canadian military, a descriptive study of technical and occupational training has not been completed by any previous researcher.

In view of the limited amounts of previous research in this topic area, this study may be justified to any future researchers in providing a baseline of information from which further civilian research can be conducted.

REVIEW OF THE LITERATURE

A review of the standard references and data bases which provide the findings of educational research revealed that no research dealing with technical and vocational training of military personnel were available.

A study of the bibliographical references and data compiled to produce standard references to Canadian military studies set the format for writing military history. The accepted format for producing military histories was to examine campaigns conducted by the military forces in pursuit of national policy. In the majority of all references cited, the categories of general, particular and regimental histories were utilized. Many of the general surveys were memoirs of retired soldiers and their roles in the evolution of their regiments.

Prior to the First World War, the majority of sources for military information tended to be in the field of biographical reminisces which recounted previous campaigns and the individual role of the author. Samuel Steele's **Forty Years in Canada**, Strange's **Gunner Jingo's Jubilee**, and Denison's **Soldiering in Canada** offer interesting accounts of the juvenile years of the Canadian military. The nature of military documentation from the First World War to the Persian Gulf War of 1990-1991 tends to emphasize the national image composed of government policy and then military response as demonstrated by division and then regimental involvement. The role of the individual, with exceptions of accounts of heroism, tends to be diminished. These compilations of military evolution or separate campaigns are well documented in Stanley's **Canada's Soldiers** which describes the military evolution from conception to 1960. Other accounts which follow the same format are Stacey's **The Canadian Army: 1939-1945**, Morton and Granatstein's **Marching to Armageddon** and **A Nation Forged in Fire**. **Canadian Brass** by Harris deals with the quest of the Canadian military to be recognized as a professional organization, while **A Heritage At Risk** by T. C. Willett examines the Canadian militia as a social institution.

It is possible that the majority of Canada's 74 regiments (Foster, 1987, pp. 249-250) have written or published their regimental histories from conception up to a certain publication date. These accounts are filled with the names of officers, brave deeds completed by officers and other ranks, realistic recounting of the tragedy of warfare, and tales of battle drills in preparation for battles and campaigns. Even the most recently published (1990) regimental histories follow this format, as in, **Gallant Canadians: The Story of the Tenth Canadian Infantry Battalion 1914-1919** by the late Daniel Dancocks.

While logistics is always given a high value in military publications, very few of the authors provide information or detail on the occupational training completed by the military personnel which allowed for the thousands to be fed by the cooks in their field kitchens or the thousands of vehicles to be maintained by mechanics utilizing their own innovative skills, often without benefit of a fixed repair shop. In place of these accounts, there has been created a Valhalla of deserving heroes, such as Private Harry Brown of the 10th Battalion who won the Victoria Cross for bringing by hand a message to his officers and dying of wounds with the last words, "Important message" (Dancocks, 1990, p. 135). Neither can we forget eighteen year old James Richardson, who played the bagpipes for the 16th Battalion at the Battle of the Somme in 1916 and earned a Victoria Cross by playing the pipes "up and down in front of the wire for fully ten minutes...he got them going, I got what men I could together, we got through the wire" (Swettenham, 1973, p. 45).

Apart from the standard references, military publications fall into two categories; the first one being for internal usage and training which are not available to civilians through security classifications, and the second one being official publications such as **Sentinel**, **Forum**, and **Canadian Defence Quarterly**. **Sentinel** is designed as a public relations medium filled with photographs of the military in various stages of training or rescues, but with very little technical training information. The other two publications are scholarly collections of articles dealing with national policy and military research and development.

A review of dissertations on military subjects was examined and found to be lacking in this particular field of interest. Tony Yee's unpublished master's thesis (1977) entitled **A Description of the Procedures Used for Civilian Accreditation of Military Occupations in Canada** is more concerned with civilian accreditation of military occupations than with any description of technical or vocational training of military personnel.

The Canadian Forces Personnel Applied Research Unit (CFPARU) publishes numerous working papers, technical reports and conference papers dealing with many aspects of program evaluations involving their personnel. CFPARU publications were utilized by the researcher to obtain current evaluation reports of the various occupational programs and problems encountered in Canadian socio-demographics to obtain recruits.

DEFINITION OF TERMS

The following operational definitions which specifically apply within the framework of this research study are defined below.

CANADIAN MILITARY

It must be noted that the Canadian military have used several names before and after Confederation. The word "structure" will be used in the context of "involving the arrangement of status and stratification in a hierarchial class system" as defined by **Webster's Third International Dictionary**. Likewise, from the same source, "organization" will be defined as "the administration and functional structure of an organization including the established relationships of personnel through lines of authority with delegated and assigned duties."

Prior to the unification of the three services (army, navy, and air force) in 1968, "Canadian military, military structure and military organization" will be reciprocal in use and used to define the entire organization. Where references are made reflecting only the land element, then the term "Canadian army" or "army" will be used. Likewise, when any reference is made to the navy or air force, then "Canadian navy" or "Canadian air force" will be used. References after 1968 implying the entire organization will be "Canadian Forces" with the appropriate "Command" title. An example of this would be to refer to "Mobile Command" which includes all regular and reserve "army" units.

The term "active militia" designates the part time force of citizen soldiers. The generic term of "militia" and "reserves" will be used substitutive to each other to describe the part time non-professional military personnel.

CAREER FIELD

The definition of "career field" is taken from the **Canadian Forces Publication (CFP 123) 1975** to mean:

> a grouping of trades related by an identification of similar knowledge and skills. A career field may consist of a single trade or two or more trades which are similar in skills and knowledge, and in which progression from the lowest to the highest takes place in the individual trades, or two or more working trades which feed into a supervisory trade (p. 2).

TRADE (MILITARY)

The definition for a "military trade" is again taken from **CFP 123** with the meaning:

> a military trade is composed of a number of related functions embracing similar knowledge and skills associated with the performance of a particular series of duties which classifies men according to their special expertise required to perform select military jobs (pp. 2-3).

TECHNICIAN

The accepted definition of a technician is obtained from **The Canadian Classification and Dictionary of Occupations** (1971) as:

> a worker who performs a limited number of technical functions in a physical, science, life science, or engineering specialization, primarily in relation to installation, operation and maintenance, using a basic

> knowledge of specific, mathematical or engineering and drafting design principle and practice (pp. 6-7).

DATA COLLECTION

The following primary sources were used to collect data information, facts, and statistics related to this study: Federal statues that enacted and regulated the Canadian military, annual publications of the Canadian Forces, pamphlets utilized by the Canadian Forces which placed emphasis on technical and vocational training, and publications of the Canadian Forces and of CFPARU which have been declared unclassified.

Secondary sources were also researched and reviewed for information relating to the technical and vocational training of military personnel. These sources included: references written by other researchers or authors on the topic of the Canadian military and training procedures, military publications which are available to civilian subscribers, regimental histories, autobiographies of military personnel and newspaper advertisements placed by the Canadian Forces.

INSTRUMENTATION

Interviews were conducted with selected military personnel in order to supplement and reinforce information obtained from written sources. The use of a personally conducted interview has several advantages over a questionnaire. In the first place, the subject of the interview can be placed at ease, thereby securing more candid responses. In addition, the researcher "will be able to follow up responses of the subject in a manner not possible with a written questionnaire" (Popham, p. 101).

Popham (1988) provides in **Educational Evaluation** a variety of data collection methods that could be adapted for interviewing selected personnel. Among these methods is the interactive method of collecting ethnographic data which will provide "first hand" information. An ethnographic data gathering strategy would permit the accurate representation of the selected personnel. Not only would this data "allow for the understanding of any particular groups but would take the additional step of appraising that the data collected would be understood by the researcher" (Popham, p. 43). Several of these interactive methods that could be adapted for this research are: participant observation, in which the researcher would be granted access to a military site to observe and make field notes on occupational training or implementation; key informant interviewing, in which the subjects selected possess special knowledge of a given occupational trade; and career histories composed of narrative accounts of their professional lives which allow the researcher to gain "insight into that particular occupational area" (Popham, p. 44).

POPULATION FOR INTERVIEW

Individuals selected to be interviewed are members of the Canadian Forces with intimate knowledge of trade occupations or involvement in the direction of occupational training. The individuals differed in rank structure and trade specification. These personnel included Unit Training Officers, Education Officers, Officers, and other rank personnel located at CFB Calgary or associated militia regiments or battalions located in Calgary.

ORGANIZATION OF THE REMAINING CHAPTERS

The remaining chapters are organized as follows:

Chapter II	Review of Related Literature
Chapter III	Overview of Technical and Vocational Training to 1914
Chapter IV	Overview of Technical and Vocational Training to 1968
Chapter V	Current Technical and Vocational Training Study
Chapter VI	Summary, Conclusions, and Recommendations for Further Study

CHAPTER II

REVIEW OF RELATED LITERATURE

INTRODUCTION

The first chapter of this thesis described the problem to be researched and presented the research methodology that would be required to collect data needed to complete this descriptive topic. The purpose of the second chapter is to examine the collected data which was either obtained by or made available to the researcher.

It became self-evident during the search for related literature that previous educational research on technical and vocational training in the Canadian Forces were not formidable with regards to quantity or quality. There is an obvious lack of researchers in this particular field of military science. Research conducted by military historians generally passed over any references to technical or vocational training in favour of campaign accounts, political interference or indifference, individual heroism, and the impact upon Canadian society by the Canadian Forces.

DATA BASE AND BIBLIOGRAPHICAL SEARCH

The primary step in obtaining relevant literature was a computer search utilizing the **Educational Resources Information Center** (ERIC) data base. This search was then extended to cover **Sociological Abstracts** (Sociofile) and **Resources in Education** (RIE). The following descriptors were selected from the **ERIC Thesaurus** (1988) to assist in data base searches: Canadian military and technical or vocational training, Canadian military and technical or vocational training or skills, Canadian military and occupational training or trades, Canadian military and technical or vocational trades, Canadian military and occupational training or trades, Canadian military and "on the job" training. The above descriptors were then adapted with "Canadian Armed Forces" in place of "Canadian military". This procedure, using the above descriptors, resulted in a total of eight listings. From this procedure only one article was selected, **Performance-Oriented Electronics Training for the Canadian Armed Forces** by Robin McNeil which subsequently was already in the researcher's possession and was cited once as a reference source.

In addition to the above data bases, the following sources were explored: **Canadian Periodical Index**, and **Microlog: Canadian Research Index**. Once again there were no articles which were considered appropriate for this particular research topic. The search was expanded to include military bibliographies of which there were three compilations which applied to the Canadian military: **Regiments of the Empire: A Bibliography of Their Published Histories, The Canadian Military Experience 1867-1983, a Bibliography**, and **Bibliography of CFPARU Publications: 1948-1988.** From these bibliographies several titles were obtained which provided secondary sources for military units associated with technical and vocational training.

DISSERTATIONS AND THESES

From a review of **Comprehensive Dissertation Index Supplements, Canadian Educational Index** and **Canadian Theses,** it became apparent there were no theses identified with the Canadian Army and technical or vocational training. One thesis, **A Description of the Procedures Used for Civilian Accreditation of Military Occupations** by Yee (1977) provided information on the procedures utilized by provincial apprenticeship boards to accredit military trade experience towards trade certification in civilian life. This thesis was informative in describing problems encountered by retiring military personnel in equating their military trade experiences to comparable civilian trades but did not provide information regarding how the Canadian Forces trained personnel in trade occupations.

CANADIAN FORCES PERSONNEL APPLIED RESEARCH UNIT (CFPARU)

The Canadian Forces maintains an applied research unit which provides technical notes, technical reports, working papers, research papers, and conference papers on various aspects affecting the Canadian military infrastructure. CFPARU was contacted in 1990 with an initial request for six publications which were considered "unclassified" and made available to the researcher in microfiche form. A secondary request made in 1990 for additional publications resulted in a refusal by CFPARU to provide more than ten additional documents. At this point, research was then directed to an extensive review of secondary sources. In November, 1991, Professor Konrad of the University of Alberta wrote on behalf of the researcher to the Commanding Officer of CFPARU (Appendix A) requesting review of numerous publications. In this letter, Dr. Konrad emphasized that these documents would be safeguarded by the University of Alberta and the return of the documents to CFPARU upon completion of the thesis. Subsequently, a telephone conversation between Dr. Konrad and Major Mendes of CFPARU, and a response letter by CFPARU, dated January 10, 1992, (Appendix B) provided the release of the requested documents to the researcher. The response letter by CFPARU also placed importance on the safeguarding and the return of the documents upon completion of the thesis. Upon receiving the CFPARU documents through the University of Alberta, it was noticed that the inside cover of each document was stamped with "Release Conditions" which recorded the name of the researcher and the conditions under which the documents were made available to the researcher (Appendix C). The condition that the improper or unauthorized disclosure of the document information may constitute an offence under the Official Secrets Act demonstrates the seriousness of the Canadian Forces levels of classification regarding military publications.

The information regarding the problems encountered in obtaining military publications is not to be construed as a criticism of the Canadian Forces or of CFPARU. The researcher relates the above information to demonstrate the difficulties of a civilian researcher in obtaining primary military publications. Appreciation must be extended to CFPARU for releasing the documents to the University of Alberta and the researcher, as information required for the completion of Chapters lV and V would not have been possible without the cooperation of CFPARU.

Several of the CFPARU documents reviewed provided valuable information in three areas of current military dialogue; the first area examined the impact of Canadian socio-demographics upon military recruiting, the second area provided military concerns regarding the quality of recruit applicants and the third area examined the current recruiting procedures utilized by the military to obtain quality recruits for trades training.

SOCIO-DEMOGRAPHIC TRENDS

The first area presents socio-demographic trends and assesses their impact upon the Canadian military and the dependency upon Canadian society to provide recruits for an all volunteer force. In **Military Implications of Socio-demographics and Related Changes in the 1980s and 1990s** by Tierney and Pinch (1980) relevant past and current socio-demographic trends and the impact on recruits for this volunteer force were examined and projections for future policy direction presented. Tierney and Pinch placed emphasis on two critical trends affecting the military with regards to the decreasing manpower pool. These trends were: "greatly increased student retention in the secondary school system in all Canadian provinces" (p. 2), and "greatly increased opportunities and consequent higher participation rates at the post-secondary levels" (p. 2). Statistics were provided which demonstrate that the prime recruiting age groups (17-19 years old) had decreased by as much as 50 percent over a 20 year span (1960-1980) and that this change was primarily the result of the expansion and transformation of the educational system which competes with the Canadian Forces for "job and skill oriented youth drawn primarily from lower-middle and working class backgrounds" (pp. 2-3). In light of the technological trends in which the "support systems of the military are also becoming highly technological as the reliance on computers increases" (p. 9) in various areas, Tierney and Pinch presented policy alternatives such as Land Operations Trade Reassignment Programme (LOTRP) designed to decrease attrition of trained personnel through reassignment to other occupational trades and Skilled Trades Entry Plan (STEP) designed to attract recruits in possession of skilled trades acquired through civilian technical training.

The data presented by Tierney and Pinch was updated to 1985 in **Socio-demographic Trends and Related Changes in Canadian Society Affecting the Canadian Forces Personnel Supply** by Tivendell and Gaudet (1985). This study focussed on the effects of numerous variables identified by the Canadian Forces in meeting personnel requirements (p. 1). The conclusions reached by Tivendell and Gaudet reinforce and confirm earlier studies conducted by CFPARU that recruitment policy changes would be necessary (p. 46). In addition, the findings of this study "point to the need for programs to attract and enroll more community college youths to meet both current and future high-technology requirements" (p. 46).

QUALITY OF RECRUIT APPLICANTS

The second area of research by CFPARU deals with the ramifications of Canadian socio-demographics upon the quality of recruit applicants entering the Canadian Forces. Traditionally, the Canadian Forces relied upon unskilled applicants to complement available positions in the technical and vocational trades in the knowledge that quality training would produce skilled personnel. In **Unskilled Male Recruits for the Canadian Forces: Trends and Projections to 1985** by Captain Cotton (1974), data was provided which demonstrates that 85 percent of the total number of people recruited were of the unskilled category. In the 1970s the decreasing Canadian birth rate and the increasing education retention levels were causing difficulties to military recruiters in order to meet personnel replacement quotas (p. 1). Cotton supplemented previous data in 1975 with **Labour Mobility Patterns and Military Manpower Supply in Canadian Society** in which the author examined personnel attrition in the Canadian Forces in comparison to job employment and turnover patterns in the Canadian economy. The recruiting characteristics of the Canadian Forces prior to adaptive changes in the 1980s with the idea of the "career serviceman" (p. 28) contributed to the continuing high attrition rates of unskilled personnel. Training and employment were viewed as "cumulative, inclusive processes which occur within the military environment...higher ranks are selected from within the manpower resources at lower ranks, with previous experience and performance being the main criteria for upward mobility" (p. 28). In addition, as all recruits were considered "unskilled" this viewpoint tended to "discourage entry among individuals who have some years of employment experience as the hiring practices of the Forces (sic) make labour mobility of these individuals virtually a losing proposition" (p. 29). As the Canadian military was concerned over the attrition rate of personnel, Cotton examined previous literature on labour mobility and provided suggestions to assist the Canadian Forces to stabilize the reduction of personnel who came primarily from the younger inexperienced sector of the labour market. These suggestions were:

> a. every attempt be made to provide applicants and enrollees with accurate and adequate information about employment conditions in the military....
>
> b. consideration be given to formally recognizing differences in educational achievement in the key 17-20 year old group. The grade 12 recruit is qualitatively different from his or her grade 8 counterpart....
>
> c. turnover might be reduced if the Canadian Forces adopted a more tolerant attitude toward individual adjustment to military life during the first few months of employment
>
> d. the provision of increased remuster opportunities... offers a potentially profitable avenue for reduction of attrition (pp. 3-4).

A growing awareness by the Canadian Forces in the 1970s of the inadequate capacity of Canadian society to generate unskilled recruits in sufficient quantity led to proposed adaptive programmes to allow lateral entry from civilian occupations to military occupations. These adaptive programmes as presented by Pinch and Cotton (1976) in **Expanding the Recruit Market for Other Rank Personnel in Selected Military Trades** would assist the military according to an analysis of CFPARU retention data by estimating "each qualified lateral entry recruit would reduce the unskilled quota by two persons (p. 16). A further co-authored report entitled **Educational Change and Military Adaptation in Canada** (1978) expanded upon the adaptive programmes such as the Lands Operations Trade Reassignment (LOTRP) and the Lateral Entry Programme (LEP) which later became known as Skilled Trades Entry Plan (STEP).

RECRUITING PROCEDURES

A major CFPARU study, **Military Attitudes and Values of the Army in Canada** by Major Cotton (1979) examined the "negativism engendered in new entrants towards employment in the Forces may be the results of gaps between expectations and experiences on the job arising from the induction [Recruiting and Training] processes" (Donnelly, Cotton, and Tierney, 1980, p. 30). Data compiled by Cotton dealing with the negative experiences of recruits regarding initial recruiting information on military trades and occupations led to the conclusion "improved vocational counselling at recruiting and subsequent induction/training phases could do much to establish more realistic expectations toward service life" (p. 34). Within a few years of Cotton's research report, the Canadian Forces modified the recruiting procedures to provide improved vocational counselling in the attempt to attract either a better educated unskilled recruit or a recruit who already possessed technical skills obtained through a civilian post-secondary educational institution.

This "integrated set of counselling tools" (Ellis and Angus, 1985, p. 1) employed by the Canadian Forces Career Information System (CFCIS) utilized audio-visual and computer technology with the aim of improving the person-job match; "whereby the goals, interests and abilities of Other Rank personnel are matched with the characteristics and conditions of service associated with the trades into which they are enrolled" (p. 1). The counselling procedures used by CFCIS were documented by Pelletier (1984) in **The Canadian Forces Career Information System** in which the Orientation Video (OV), Automated Counselling/Data Processing Facility (ACDPF), Trade and Lifestyle Videotapes (TLVs) and Printed Trades Briefs were described. A more detailed analysis of the TLVs is provided in **Introduction of Trade and Lifestyle Videotapes (TLVs) Into a Canadian Forces Vocational Counselling Setting** by Wilson and Flynn (1982). In this analysis of the TLVs, Wilson and Flynn examine the "effectiveness of the audiovisual medium in presenting realistic job previews to prospective applicants" (p. 2). The authors conclude with the agreement that "vocational psychology has established a link between the amount and quality of career information learned and the quality of decisions made with regards to choosing a career" (p. 35).

Although the CFPARU documents were extremely important in understanding current military concerns regarding the quality of recruits to begin basic trades training, there were additional secondary sources which provided a continuum of the chronological concept in the evolution of technical and vocational training. These secondary sources included military publications, regimental histories, personal recollections, military campaigns and general military histories.

MILITARY PUBLICATIONS

A review of several military publications were examined for this research and included: **Canadian Army Training Memorandum** (CATM), **Canadian Defence Quarterly**, **Sentinel**, and various Canadian Forces booklets or trade specification sheets designed for the applicant recruit. The **Canadian Army Training Memorandums** provided numerous examples of military technical or vocational training conducted during the Second World War and rehabilitation programs offered to veterans immediately after the cessation of hostilities. The current military publication, **Sentinel**, is designed as a public relations publication available to military personnel and the Canadian public. Contents of **Sentinel** concentrate on current diverse topics such as United Nations peacekeeping duties, search and rescue, personnel and unit contributions to the positive image of the Canadian Forces, and sundry articles in order to provide "a periodical with informative articles of general interest, emphasizing people rather than politics" (Dorge, 1990, p. 22). **Canadian Defence Quarterly** can be considered a scholarly publication concerned with military technical advances, but not technical applications with regards to training as it applies to the Canadian Forces. In addition to discussion of technical advances, **Canadian Defence Quarterly** provides numerous articles dealing with military history. There were, however, a serious lack of articles dealing with technical or vocational training.

The Canadian Forces provides applicant recruits with numerous publications dealing with information on military occupations and trades. These publications include a booklet, **Careers in the Canadian Armed Forces for Non-commissioned Members**, numerous pamphlets on available programs, and specification sheets which provide detailed information on initial training courses for all occupations. These publications were extremely valuable in presenting an overview of current military occupation training, but did not provide any detailed information on initial or advanced course content.

SECONDARY MILITARY SOURCES

From the perspective of military historical research in Canada, there is no lack of materials available. The military history of Canada is extremely well documented in terms of personal recollections, unit and regiment collections, campaign accounts, official histories, and general history. The secondary sources examined in this research were varied from **The Battle for James Bay: 1686** by Kenyon and Turnbull (1971), **Richardson's War of 1812** edited by Casselman (1902), Stanley's **Canada's soldiers: the Military History of an Unmilitary People** published in 1960, **The Armed Forces of Canada 1867-1967: a Century of Achievement** by Goodspeed (1967), to **We Stand on Guard: an Illustrated History of the Canadian Army** by Marteinson (1992); all demonstrate a well-researched and documented compilation of the vast Canadian military heritage. Additional sources were also examined: Morton's **A Military History of Canada: from Champlain to the Gulf War** (1992), **Strange Battleground: Official History of the Canadian Army in Korea** by Wood (1966), **The Last War Drum** by Morton (1972), **Vimy** by Pierre Berton (1986), **Canadian Brass: the Making of a Professional Army 1860-1939** by Harris (1988), Dancock's **Legacy of Valour: the Canadians at Passchendaele** (1986) and **Gallant Canadians: the Story of the Tenth Canadian Infantry Battalion 1914-1919** (1990), Denison's **Soldiering in Canada** (1901), Steele's **Forty years in Canada** (1972), **Gunner Jingo's Jubilee** by Strange (1988), **Marching to Armageddon: Canadians and the Great War 1914-1919** by Morton and Granatstein (1989), **A Nation Forged in Fire: Canadians and the Second World War 1939-1945** by Granatstein and Morton (1989), and **War and Peacekeeping: from South Africa to the Gulf - Canada's**

Limited Wars by Granatstein and Bercuson (1991). All reinforce general surveys and overall summaries of a military heritage. The difficulties, in regard to this research, were that the vast majority of the secondary sources examined provided limited information on the development of the ancillary services which provided technical and vocational training in the operation and maintenance of the Canadian military infrastructure.

Examples of limited references to ancillary services were found in the majority of sources examined. The creation of the specialized corps were given scant mention in Goodspeed's **The Armed Forces of Canada 1867-1967: a Century of Achievement**, "Permanent engineer, army service and ordnance corps units were formed in 1903, and Dundonald's initiative gave the Canadian Militia a Signals Corps before one existed as an entity in the British Army" (p. 22). The achievement of the ancillary units were given additional mention, "The Royal Canadian Corps of Signals, The Royal Canadian Army Service Corps, The Royal Canadian Army Medical Corps, The Royal Canadian Ordnance Corps, The Royal Canadian Army Veterinary Corps and the Canadian Army Postal Corps were all reorganized" (p. 95). Stanley's **Canada's Soldiers: the Military History of an Unmilitary People** describes the inclusion of medical services during the Boer War, "As the war dragged on, the War Office gratefully accepted a Canadian offer to raise further troops at British expense. These included a regiment of mounted rifles [the 2nd C.M.R.], a

Field Hospital Company, and eight Nursing Sisters of the recently formed Canadian Nursing Service" (p. 281). Stanley fails to enlighten general readers or researchers with additional information on vocational and technical training conducted by these military personnel. The contributions of specialized corps during the First World War is passed over by Stanley in regards to any explanation of specialized training required to provide services by various units, "Canadian foresters cut timber in Great Britain; Canadian railway troops served with the British as far afield as Palestine; and Canadian instructors went to the United States to train American troops" (p. 333). The same limited viewpoint can be found in **Marching to Armageddon: Canadians and the Great War 1914-1919**, "Canadian Railway Troops, 19,000 strong, played a major role in building and operating the British army's railways; 12,000 members of the Canadian Forestry Corps worked in French forests" (Morton and Granatstein, 1989, p. 198). The importance of the Army Service Corps, responsible for many vocational requirements, is given the epitaph of "unloved but essential Army Service Corps delivered food, ammunition, and fuel - usually at a safe distance from the fighting" (p. 52). The role of the ancillary services receive scant attention in compilations of the Second World War; Morton's (1992) **A Military History of Canada: from Champlain to the Gulf War** describes the value of technical and vocational personnel, "Thousands of soldiers served in ancillary services, from tunnellers working at

Gibraltar to companies of the Canadian Forestry Corps, once again in the woods of northern Scotland" (p. 209). The contributions of specialized corps were also given scant notice in **Strange Battleground: Official History of the Canadian Army in Korea**. Wood (1966) provides congratulatory mention to the Canadian Postal Corps, "This small but vital unit continued to function smoothly throughout the Korean experience" (p. 142). Dancock provides a more sympathetic understanding of specialized corps in **Legacy of Valour: the Canadians at Passchendaele** in describing the difficult tasks involved in maintaining personnel with supplies and services during the First World War;

> The Canadian Army Service Corps lived up to its informal motto at Passchendaele: the impossible we do immediately; the miraculous takes a little longer. The lorry drivers who risked life and limb to deliver supplies to the forward dumps more than merited this tribute... (p. 109).

While Dancocks acknowledges the importance of ancillary services, there was no mention of vocational training required for military personnel to provide vital services. In the review of literature, it became necessary to read between the lines to decipher the roles and the extent of technical or vocational training provided by specialized corps. One example of this is taken from a description of military reorganization between the wars as it applied to the Royal Canadian Corps of Signals;

> A few things had changed, however. With the tremendous development of communications technology since 1914, the Royal Canadian Corps of Signals had much greater prominence, and signallers were soon involved in building and manning radio networks for the Air Force, Mounted Police, and other government departments, particularly in the far north (Marteinson, 1992, p. 212).

From the above, the researcher can only speculate on the availability and content of formal courses to instruct signalmen in rudiments of electricity or the extent of informal courses where signalmen obtained trade qualifications by observation of senior tradesmen and hands on applications.

Several secondary sources examined by the researcher did provide information regarding vocational training of personnel. These included **Canada in the Great War** by Wallace (1919) and **The Story of Canada in the Great War** by Cooper (1920) with each author dedicating several chapters to the efforts of the auxiliary services. Although Wallace and Cooper did not attempt to analyze the technical or vocational training involved by ancillary services to maintain or support combat personnel, they did provide valuable information written shortly after the First World War on the Canadian Army Medical Corps, the Dental Corps, the Railway Troops, the Forestry Corps, and the Khaki University concept which assisted military personnel in upgrading academic skills.

There were additional secondary sources which provided not only chronological sequence to the development of specialized corps from the First World War to the current date, but also supplied information on formal and informal technical and vocational courses for military personnel. These included **Seventy Years of Service: a History of the Royal Canadian Medical Corps** by Nicholson (1977), **Canada's Craftsmen: the Story of the Corps of Royal Canadian Electrical and Mechanical Engineers and of the Land Ordnance Engineering Branch** by Johnston (1983), and Rannie's (1984) **To the Thunderer his Arms: the Royal Canadian Ordnance Corps.** In addition to compilations of specialized corps, **Canadian Brass: the Making of a Professional Army 1860-1939** by Harris (1988) provides documentation on the development of the Canadian military as a professional institution which reflected upon its ability to conduct technical training.

NICHOLSON

Nicholson (1977) demonstrates the extent of lack of formal military occupational training for personnel in the medical service upon its conception during the North West Rebellion of 1885. The concept of vocationally trained medical personnel who are also serving members of the Canadian military also explains the emphasis placed upon civilian institutions to train required personnel;

> With no Hospital Corps or Ambulance Corps existing in Canada, Dr. Bergin ordered two field hospitals to be recruited, each having a complement of six officers, whom he personally selected. The necessary dressers and orderlies were drawn from the graduating class and the third and second year students of the medical faculties of universities in Montreal and Toronto (p. 28).

In addition, Nicholson continues to show the importance placed upon civilian medical personnel to provide military medical requirements in the Boer War, "Civilian volunteers who were properly qualified as medical practitioners might also be selected for the Army Medical Staff" (p. 43). From the creation of the Medical Corps in 1904 to the publication date of 1977, Nicholson chronicles the progress of the military medical occupations in a positive fashion. Throughout **Seventy Years of Service: a History of the Royal Canadian Medical Corps**, Nicholson emphasized the importance of vocational training by military medical staff, whether it is from civilian institutions prior to enlistment or through formal courses. In a reference to the importance of vocational training for military medical staff, Nicholson states,

> Yet enthusiasm without military training and experience would not be enough. It was well that in such circumstances the Army Medical Corps would have available a small but effective nucleus of well-trained military nursing sisters, ready for mobilization (p. 66).

Although Nicholson was referring to the status of nursing sisters in the Corps in 1914, the comments could and do apply equally for all ancillary services in the Canadian Forces today.

JOHNSTON

Johnston's (1983) **Canada's Craftsmen: the Story of the Corps of Royal Canadian Electrical and Mechanical Engineers**

and of the Land Ordnance Engineering Branch provided the researcher with an enormous amount of not only background information on ancillary services, but also a large quantity of information on the formal and informal training courses of a modern mobile military force. Although Johnston concentrates on post Second World War occupational training, he does provide information regarding application of vehicle repairs during the First World War and the lean years of a peace-time military prior to 1939. The genesis of the corps during the First World War is described as,

> impromptu workshops were organized and staffed by all the armourers in the division, less one per brigade. They brought with them their tools, equipment and whatever components they had on hand....These small arms shops could, in addition to rifles, repair the division's machine guns, bicycles, replace rivets in helmets and, on a limited scale, manufacture parts (p. 6).

Johnston's description of the Royal Canadian Electrical and Mechanical Engineers (RECEME) ability to maintain the vast vehicle fleets required by the Canadian military during the Second World War is a tribute to Canadians who received the majority of their occupational training as civilians;

> The success of RECEME, however, was not only good organization but also the trades skills of individual craftsmen. Trades training, however, was a rather informal and unstructured arrangement....However, there was always a nucleus of experienced tradesmen around and they guided the less skilled and less experienced tradesmen (p. 73).

If the majority of RECEME's skilled tradesmen during the Second World War were civilian trained, Johnston also emphasized the military trades training which guaranteed that there would be no shortage of skilled technicians where required. The Canadian Ordnance Training Centre which opened in 1939 is summarized by Johnston as providing "one month of general military training, three months of technical orientation training, six to ten months trades training and, finally, two months driving and maintenance training" (p. 97). Unfortunately, Johnston does not provide additional details on the contents of trades training. The above statement holds also on Johnston's post Second World War analysis of RECEME training and involvement with United Nations peacekeeping duties. A summary of the Apprenticeship Training Plan, effective from 1954 until 1967, describes trades training as "commenced in the first year, and was the major focus of the second year of the apprentice program" (p. 189). Again, unfortunately, Johnston does not provide additional information regarding types of courses and content of courses. In all fairness to the author, this researcher was able to find relevant information regarding trades training which were not available in the majority of other related literature examined.

RANNIE

Rannie's position in **To the Thunderer his Arms: the Royal Canadian Ordnance Corps** (1984) is similar to other examined literature, in that the Canadian military depended heavily upon civilian trade expertise in times of hostilities to maintain the technical and occupational needs of the

Canadian military. The comment, "It is almost a national tradition in Canada that active participation in a war should be followed by a rapid decline of interest in military matters" (p. 50) is reinforced by comments regarding Second World War procurement of trained personnel,

> RCOC services required appointment of many civilians with expertise in administration, procurement and supply. Executives from large merchandising firms technical experts from industry were much in demand (pp. 63-64).

Rannie also points out that military trades training only became a priority when,

> Canadian industry converted from peacetime manufacture to war production, fewer and fewer tradesmen enlisted in the Army....As a result, the Army was forced to institute its own trades training program in order to fill establishments (p. 209).

However, Rannie does give credit to the military for the establishment of training centers, even though there was little information regarding types of courses and content of courses offered to train personnel.

HARRIS

In the examination of **Canadian Brass: the Making of a Professional Army 1860-1939** by Harris (1988) the lack of technical training in the Canadian military is clarified as a result of the lack of professionalism within the military structure prior to the Second World War. The government financial constraints between the two world wars "sealed the fate of the fifteen division army and precluded the purchase of new equipment" (p. 193). The numerical decrease in post war personnel coupled with financial constraints and limited procurement of new equipment allowed for the continued belief that technical training was not important in the development of a professional organization. The continued belief that skilled civilians would provide technical and vocational requirements upon recruitment during hostilities allowed the government to justify a smaller reconstituted peacetime permanent force. As the Canadian military were limited by financial constraints and designated personnel numbers, the available option was to concentrate on the professional training of officers, "if these veterans were to remain in touch with contemporary developments; if the succeeding generations of junior officers was to learn its profession... the army had to have a well-conceived and critical system of professional education and training" (p. 194). Harris places some of the blame upon the military establishment even though "the material well-being of the army was clearly the government's responsibility" (p. 198); the "uncertainties produced by a rapidly developing technology" (p. 198) and the attitude of the military toward this technology allowed for the continuation of limited internal technical training of personnel. The prevailing attitude of many senior officers who had received their training prior to or during the First World War did not allow for the post war technology. It was debated "that it was unwise to alter organization and tactical doctrines in anticipation of technological change that might very well fall short of expectations" (p. 199). This overall neglect by the military with regards to accepting recent technological innovations, according to Harris, is supported with "despite doubts expressed about mechanical reliability, advances in technology were making mechanized vehicles far more dependable then they had been during the war" (p. 199). The military, as believed by Harris, were unable to accept recent technical innovations that "came so quickly that few designs were ever stabilized" (p. 199); and in spite of recent innovations, the military "decided to wait until these reached mass production rather than saddle the army with more obsolete equipment" (p. 200). The summary of this military belief, according to Harris, is that the military were not willing to provide personnel with technical training on machinery that would be obsolete within a short period of time. This viewpoint, and the economic reality of the 1930's limited the army to "maintaining what it had and to procuring only a few trucks and light tracked vehicles" (p. 201).

While Harris was concerned with the professional development of the Canadian military as an institution and not with technical or vocational training of personnel, a great deal of information on technical training can be derived from his comments on the evolutionary achievement of the professionalism of the Canadian military. His comments on the development of the military as a separate entity speaks also of the development of technical training. In this Harris was in agreement with the viewpoints expressed by the majority of authors examined: that technical training was conducted in an informal atmosphere due to a lack of acceptance of rapidly advancing technology by the military and the general belief by the government and military regarding recruitment of skilled civilians in time of hostilities was paramount as "Canada has preferred to respond to crises with ad hoc, improvised arrangements" (p. 220). These "improvised arrangements" developed according to Harris as a result of "the way Canadian society has developed, influenced by its geographic isolation, its relatively small population, and its dependence first upon Great Britain, and then upon the United States, as a defender of last resort" (p. 220).

MILITARY PERSONNEL INTERVIEWS

In order to supplement and reinforce information obtained from written sources, an interview with selected Canadian Forces personnel was conducted on December 7, 1992, upon completion of Chapter V. Upon the advice of Captain Porter of the 1st Service Battalion located at CFB Calgary, the researcher was introduced to Chief Warrant Officer Seyffert (the Regimental Sergeant Major) of 1st Service Battalion and Chief Warrant Officer Thompson also of 1st Service Battalion. Prior to the interview, the researcher agreed with a disclaimer that views expressed were those of individuals and did not necessarily reflect official opinion or policy. In addition the researcher concurred with a secondary request to ignore and to eliminate any comments not directly related to the research.

The participants were the senior non-commissioned officers responsible for the daily technical and vocational operation of 1st Service Battalion. Chief Warrant Officer (CWO) Seyffert has 31 years service in vocational and leadership areas; CWO Thompson has 29 years service in technical and leadership areas. The interview centered on initial trades training, quality of initial trades training, formal courses in comparison to informal courses (Canadian Forces Training System Schools and On Job Training programs), quality of LOTRP, POET, STEP trained personnel, and problems encountered with personnel attrition or commitments to United Nations peacekeeping duties.

CWO Seyffert was quick to point out with regards to initial trades training that the promotion requirement from Private (Recruit) to Private (Trained) involved not only a time consuming 48 months of trade training, but also required a great deal of supervision of the private by higher ranking trained personnel while employed on a Canadian Forces Base. Upon completion of 48 months of formal trades training and on the job experience, and provided the private was eligible for promotion to Corporal upon completion of Level 5 in the military occupation, then that person was considered to be properly trained in their military occupation. At this point, specialized training commences within the framework of continuous training. CWO Seyffert and CWO Thompson concurred that this time-frame was valid and required for the training of qualified personnel.

The concept of LOTRP, POET, and STEP programmes were considered relevant by CWO Seyffert and CWO Thompson. The viewpoints expressed by the participants were that these programmes were essential in fulfilling occupational needs in terms of personnel or entry level skills, and it was not an important issue whether the military occupation received civilian trained recruits (as in STEP) or provided the basic skills (as through POET). CWO Seyffert emphasized once again that regardless of the program (LOTRP, POET, or STEP) until that person completed Qualified Level 4 through formal training, hands on applications, and 48 months in the Canadian Forces, that person was considered "not trained". CWO Thompson reinforced the required time of 48 months and formal courses in terms of a military personnel being considered "trained" in the comparison of military personnel being required to document "5,000 hours on equipment and being Qualified Level V" in order to obtain provincial apprenticeship papers in a selected trade. When asked to comment on the effectiveness of trades training with regards to maintaining the infrastructure when United Nations peace-keeping duties second personnel away from the battalion, CWO Seyffert replied, "there is impact on tasking". CWO Thompson commented on United Nations peacekeeping duties as being valid in terms of providing "on the job training in the theater" and when the UN duties were completed, then personnel returned to "on job training back at the base". Both participants saw no difficulties in maintaining the infrastructure with personnel being away on formal courses, specialized courses, or "tasking" (active military participation). CWO Seyffert expressed that regardless of course requirements or tasking, "you work around the manning levels". In other words, it was the responsibility of the battalion and of the personnel involved to maintain the infrastructure wherever required.

During the interview, CWO Seyffert and CWO Thompson acknowledged that there were vast amounts of military publications dealing with contents of specialized courses on all military occupations. These publications were located at various Canadian Forces Schools and generally did not receive wide distribution. This information concurred with a previous conversation with Captain Porter of the 1st Service Battalion in which he confirmed the difficulties in obtaining descriptive surveys of technical and vocational trades. Captain Porter indicated that there were probably informal reports regarding trades training at several Canadian Forces Training Schools but these would not be available as they are not circulated among military personnel not involved with that particular trade training (Captain Porter, personal communication, November 24, 1992).

The interview with CWO Seyffert and CWO Thompson reinforced and supported the research from written sources for Chapters lV and V. Their opinions were in accordance with the research that the Canadian military does provide and maintain an effective infrastructure regarding technical and vocational training.

SUMMARY

In the vast quantity of related literature dealing with the history of the Canadian Armed Forces, there remains an obvious void in the quality of related literature concentrating on technical and vocational training within the framework of the Canadian military infrastructure. A data base search comprised of **ERIC**, **Sociofile**, **RIE**, **Comparative Dissertation Index Supplements**, **Canadian Educational Index**, **Canadian Periodic Index**, **Microlog**, and **Canadian Theses** produced a lack of educational research on technical and vocational training in the Canadian Forces.

The publications supplied by Canadian Forces Personnel Applied Research Unit were beneficial in regards to socio-demographic trends affecting recruiting and quality of recruit applicants for the Canadian Forces. Several publications by Cotton, Flynn, Park, Pinch, Tierney, and Wilson were extremely important in data obtained for Chapters lV and V.

Current military publications such as **Sentinel** and **Canadian Defence Quarterly** publish articles dealing with the positive image of the Canadian Forces, military technical advances, national policy with regards to military matters, and military research and development. With regards to this research, these military publications did not contribute many articles which could be utilized in large quantity. A military publication which did provide research data for vocational training during the Second World War was **Canadian Army Training Memorandums**. Additional military publications which assisted this research were various military pamphlets, specification sheets for various military occupations, and **Careers in the Canadian Armed Forces for Non-commissioned Members.**

There were numerous secondary sources reviewed or utilized in this research in order to provide a chronological sequence to technical and vocational training in the history of the Canadian military. Within these secondary sources, several authors, Wallace, Cooper, Nicholson, Johnston, Rannie, and Harris concentrated on specialized corps and emphasized the roles of these ancillary corps during the First World War and Second World War.

Interviews with selected military personnel was conducted upon completion of Chapters lV and V in order to reinforce and to supplement compiled research. Information was obtained during this interview regarding additional resources on military trade occupations which are located at various training locations and are not circulated to personnel not involved in those military occupations.

CHAPTER III

OVERVIEW OF TECHNICAL AND VOCATIONAL TRAINING TO 1914

INTRODUCTION

In order to produce a consistent descriptive study of how military personnel were and are trained in the operation and maintenance of its infrastructure, there must be a given chronological time when these proceedings began in Canadian society. In the procession of historical data, this date commenced on July 1, 1867, when the British North America Act was proclaimed as being in force and the British colonies of Canada, Nova Scotia, and New Brunswick joined together as the Dominion of Canada.

THE BRITISH NORTH AMERICA ACT (1867)

The authority of the new Canadian government over military control of the Dominion was given in Section 15 of the said Act "whereby the Command-in-Chief of the Land and Naval Militia and of all Naval and Military Forces of and in Canada was declared to continue and be vested in the Queen" (Driedger, 1967, p. 4). In effect, the Governor-General as the Queen's representative in Canada took up the duties as military Commander-in-Chief, subject to any national defence policies as determined by the government.

The Canadian government, in addition to receiving the authority to maintain military forces, also received through the British North American Act (1867) the exchange from British control of military materials which previously had belonged to the militia of the former colonies. These materials included "all armories, drill sheds, military clothing, and munitions of war" (Driedger, p. 49).

RELUCTANT RESPONSIBILITY

Even though the British North America Act (1867) provided for the Canadian government authority to maintain control of military forces, it did not stipulate any time frames for the creation of a permanent military force. The continuation of a military apron-string support from the United Kingdom to the fledgling Dominion was desired in many circles, political and social, even though there was an increasing anti-imperialist viewpoint being taken by both British and Canadian politicians. This viewpoint also included a desire, especially by British politicians, to cast off economic ties to the colonies and new Dominions which financially hindered the United Kingdom.

MAINTAINING THE BRITISH TRADITIONS

The gradual withdrawal of British troops from Canada, including the withdrawal of seconded military personnel to train the native military force can be grounds for discussion that Canadian control of all technical training, began only when the last British military personnel returned to their home unit bases in the United Kingdom. If this viewpoint is accepted, then Canada only commenced its own military training in 1906 when it assumed control of the last British naval bases in Canada. Since this descriptive study is primarily concerned with the technical and vocational evolution of the Canadian army, this viewpoint would have to be back dated to begin in the 1850's when British troops began to withdraw from Canadian bases to meet the political obligations of Britain in other parts of the world. This gradual withdrawal was completed by 1885 with the exception of British military units returning for short term garrison duty in support of naval bases.

The return of British troops to Canada after 1867, at a time when the accepted procedure was to have them gradually leave, is a paradoxial concept of Imperial defence policies. One of the purposes of Confederation in 1867 was to allow the Dominion of Canada to maintain and to control internal military structures while allowing Great Britain to decrease the vast financial burden of maintaining a world wide military garrison. This paradox also demonstrates the lack of technical and vocational training by Canadian authorities as the Canadian government continued to utilize senior British officers in order to provide expertise in the training of Canadian militia and the maintenance of the military infrastructure. Examples of British troop movement to duty in Canada demonstrated the lack of serious consideration given to the creation and maintenance of a national military force by the Canadian government. The 2nd Battalion of the 69th Regiment of Foot (Welsh Regiment) was ordered to Canada in August 1867 because of the threat of the Fenian movement. The Battalion was stationed in smaller units in "Brantford, London, Hamiliton, Montreal and the village of Huntington, Quebec, where they took part in the repulsion of a Fenian invasion force from the State of New York. The 2nd Battalion then returned to Quebec City where they embarked for garrison duty in Bermuda in November 1870" (Stewart, 1962B, p. 286). The above is an example of one of the many portions of British regiments that served in Canada for short term periods before moving on to garrison duties in other parts of the world. Very often, detachments of these regiments, corps, and even seconded personnel gave indications of the extent of the lack of technical self-reliance by Canadian military personnel. The extent of this lack of self reliance is demonstrated by the example of The Corps of Royal Engineers which had maintained a presence in Canada from 1697 when an officer establishment was sent to Newfoundland with instructions to use local labour to complete military construction. Units of the engineers remained in Canada until 1900 "when the last company left Esquimalt, British Columbia" (Stewart, 1962B, p. 58). The instructions given to officer establishments to utilize local labour was a good example of the extent of technical training that was available in Canada. While the British officers were trained in the rudiments of surveying, geometry, mathematics, and drawing, it was not considered desirable to train the other ranks personnel in vocational practices. Economically, the hiring of local labourers under the direction of military officers was beneficial not only to the military, but also to the local economy.

THE DECLINE OF EMPIRE

The political, economical, and military decisions made in the United Kingdom carried the same military ramifications in the newly formed Dominion of Canada. There was one underlying reason why the Canadian government was encouraged by Great Britain to take the responsibility of organizing a military structure, even though it was deliberately kept small and ineffectual considering the military might and westward expansion of the United States of America, and the vast geography that would require military enforcement. This main reason was that the Canadian political events in the control of the British Empire between 1815 and 1870, slowly, but eventually, influenced the direction that Canada would be required to pursue as a self governing Dominion.

From an economic point of view, the mercantile system which started in the middle of the seventeenth century in which the raw goods of the colonies were exchanged for the manufactured products of England had long been established and was now waning. This mercantile system was waning in light of the British supremacy in manufacturing techniques and non-colonial free trade desired by British politicians. By the nineteenth century, Britain required "free access to all economic markets for its vigorous exporters and not a closed system of colonial trade" (Barnett, 1974, p. 272).

By the mid-nineteenth century British politicians viewed the British Empire as an unwelcome political and economic responsibility as the largest economic markets existed outside of the Empire boundaries which still required military garrisons and frontiers protected against native uprisings or insurrection. An example of the manpower and equipment kept by the British in Canada clearly showed the extent that the British tax-payer contributed to maintaining a British image in a politically secure continent. Detachments of the Royal Regiment of Artillery had been in Canada from 1724 until 1907 with companies arriving and departing on a regular basis. From 1867 to 1869, the British maintained 16 batteries of artillery in several sites in Canada. A battery was composed of a various number of artillery guns based upon unit establishment and the necessary officers and other ranks required to maintain and to operate the battery. By 1870, the British decreased this number to six batteries in the new nation; three batteries being kept at the newly built citadel in Halifax which cost the British tax-payer 233,882 pounds sterling. This cost "did not include salaries and the cost of maintaining five 8 inch guns, forty five 32 pounders, twenty 24 pounders, eighteen officers and seven hundred and sixty four non-commissioned men" (Stanley, 1974, p. 183).

From 1872 until 1891, the British maintained three batteries in Halifax and withdrew the remaining batteries from the rest of Canada. In 1899, when the Boer War in South

Africa commenced, the British required additional soldiers for other active duties and the Citadel in Halifax was reduced to two batteries. In 1905 the Canadian military supplied its own personnel to replace the last British battery in Halifax. On the west coast in British Columbia, the Royal Marine Artillery "maintained a seventy five man detachment which was not replaced by Canadian military personnel until May 1907" (Stanley, p. 13).

Obviously, the British ability to defend the new Dominion with its military might was appreciated by the new government. It was not until 1904 that the Canadian government "chose a senior Canadian officer to be General Officer Commanding in lieu of a British appointed senior officer" (Massey, 1972, p. 31). The mental climate of these ex-colonials, with the exception of the French Canadian majority in Quebec, caused them to project their own concept of British law and civil docility, thanks largely to a growing influx of British immigrants, who could be depended upon to maintain and to demand British traditions and policies without a large and expensive British garrison to maintain.

The expansion of British rule in India, coupled with the mutiny of Indian sepoys in 1857 led to a massive reorganization of the British military structure in the remainder of the Empire. More military personnel had to be found for the garrisons in India at a time when the British government was trying to reduce its commitments in other parts of the Empire. Barnett states (p. 292) that the American Civil War (1861-1865) and the later menace of the Fenian expatriate Irishmen (1866 and 1870) in the United States demanded a garrison of 17,500 British troops in Canada. Only with Confederation was it possible to withdraw all but 3,500 of these troops.

THE INPUT OF CITIZEN VOLUNTEER UNITS

The establishment of volunteer military units in Canada along with political events unfolding in the British Empire in the 1850's did much to stimulate interest by citizens in the Canadian military. This interest by Canadians was eventually reinforced by the Canadian government in the Militia Act of 1855 with regards to increased time allotments for training from the previous "one day annual muster to twenty days annual training for artillery batteries and ten days annual training for infantry companies" (Massey, p. 23). This Militia Act maintained and improved the Sedentary Militia, which was basically a paper organization of every able-bodied male citizen who mustered once a year to maintain the militia rolls. This Act established "a new force called volunteers which was to be properly armed, receive regular training and be paid for time spent on duty" (Stewart, 1962A, p. 2). The Militia Act also stipulated that British officers were to be "appointed to command the military districts but not to be provided for in peace-time activities" (Hamilton, 1912, p. 392). From this, it can be observed that any technical or vocational training would continue to be obtained from civilian employees on contracted employment directed by military officers. This observation is reinforced by the example of the building of the Rideau canal by Colonel By of the British Engineers. The construction of the canal was carried out by military and civilian workers. It is interesting to note that the British recruited the 7th and 15th companies of the Royal Sappers and Miners for the express purpose of building the Canadian canal. The sappers and miners recruited were already trained in their vocations. General labour was "supplied by the recently arrived non-skilled Irish immigrants" (Stanley, p. 187).

The severity of the American Civil War (1861-1865) emphasized how ineffectually the Canadian authorities were able to handle military matters. Even though the Canadian authorities could "call out" the sedentary militia, it still fell upon British responsibility to reinforce British North America with 18,000 troops. The Fenian Raids of 1866 and 1870 merely reinforced the new Dominion's inefficient ability to take its internal responsibilities seriously. This inefficiency is well documented by Lieutenant Colonel George Denison of the Governor-General's Body Guard, a militia calvary unit founded in 1855. Lt. Col. Denison had a long association with the Canadian militia, being involved in the Fenian Raids of 1866 and the North West Rebellion of 1885. At one point during the Fenian Raids of 1866, Denison's troops were "billetted about the City of Toronto in hotels while their horses were stabled at the show grounds" (Denison, 1901, p. 85). In addition, there was no preparation for campaigning and no provisions for stores or equipment required for the men. It must be noted that any military intelligence regarding the advance of the Irish Fenians from the United States into Canada were "through the telegraph wires, operated and controlled by civilian companies" (Denison, p. 87). The lack of vocational preparation in supplying military personnel with food was demonstrated by the men being issued a large biscuit of hard tack taken from a barrel. In addition to the lack of food preparation, the lack of basic supplies such as "haversacks, water bottles, nose bags for the horses, canteens, knives, forks, or cooking utensils of any kind" (Denison, p. 98) also demonstrates a serious lack of consideration for any vocational occupations. Each soldier was expected to prepare his own food, when food was obtained and delivered to wherever the troops were located. At one point, Denison's troops received additional hard tack and beef which they had to cook by tearing down rail fences to use as fuel. The only supply of drinking water came from a local brook. An acceptable method of providing for volunteer troops was the generosity of local inhabitants. In one situation, a train load of food supplies was sent by the inhabitants of Toronto for the Toronto volunteers. It was noted that "the food was most welcome and necessary as the local commissariat was not yet organized into supplying the basic needs of the Canadian militia" (Denison, p. 111). At this point, a brief example of the continued lack of vocational training of military personnel must be provided through the ability of medical personnel to provide treatment to injured personnel. Each regiment appointed their own surgeon, who usually remained with the largest posting of troops. In one case, a young officer was thrown from his horse and suffered a broken collar bone. The surgeon set the bone, but it was a civilian who "provided the hospital care required by offering her house while he recuperated as there were no hospital facilities" (Denison, p. 124) in the military infrastructure.

MILITIA ACT (1868)

The Dominion's new Militia Act (1868) was created to correct obvious deficiencies of the young Dominion's defence, particularly in the continued face of the perceived threatening attitude of the United States. The Militia Act (1868) authorized the expenditure of "1,100,000 pounds sterling for the construction of defence works, but these funds were eventually transferred to railroad developments by 1872" (Stanley, p. 234), a forerunner of Canadian politics with regards to building up military requests for facilities and training and then in light of newly discovered priorities diverting the funds to other programs. In addition the new legislation provided for the conscription principle of all males between the ages of 18 and 60 years old, but emphasized the volunteer force as the backbone of the Canadian defence system. Drill and training were still limited to anywhere between eight and 16 days annually.

METIS INSURRECTION (1870)

The first test of the government came in 1870 with the Metis insurrection led by Louis Riel in Manitoba. Two battalions of Canadian militia were signed up for a two year duration in support of British regular troops from the Royal Artillery and Royal Corps of Engineers. The lack of any technical training was once again evident when examining the transportation and communications systems used by the military in 1870. The soldiers were not experienced voyageurs; they were regular soldiers or part time soldiers who also happened to have "civilian employment as clerks, cooks, and farmboys, unaccustomed to the back-breaking task of handling canoes or transporting supplies over long portages" (Stanley, p. 238). The Canadian geography defied the limited technology which was starting to be used by military forces. By 1870, the use of steam as a means of propulsion for machinery and electricity as a means for carrying communications was being used by military forces. There was no way possible that the movement of troops from Canada through the Great Lakes and then overland to Manitoba could have been accomplished easier through the use of technology. The Metis insurrection was handled in a manner which all military forces had used for centuries; soldiers marched on their feet and pushed or pulled all supplies required.

CONTINUED NEGLECT OF MILITARY

A lack of desire to provide adequate funding for military training by the Canadian government perturbed many British authorities. In 1870, the Colonial Secretary informed the Governor General that all British troops in Canada would be returned to home units in Britain, and that all vacated barracks and fortifications would be handed over to the government of Canada. Halifax, Nova Scotia "would be the only exception as it was required for a coaling station" (Stanley, p. 241).

This continued lack of government funding was also evident in the manner in which volunteer units were formed in this new Dominion. A group of civic-minded men desiring to form a volunteer unit would,

> be sent to the Deputy Adjutant-General of that military district and then forwarded by him with his comments for approval to the General Officer Commanding the Canadian Militia. If the new unit was given official recognition then it would receive weapons, uniforms and equipment. It then became the responsibility of the officers and other ranks to provide the unit with a high degree of efficiency (Massey, p. 28).

It was, in effect, a very inexpensive method by the government to establish and to maintain a military force.

With the embarkation of the British troops from Quebec, late in 1871, the long neglected duty of the Canadian government toward its military establishment began to change. In April of 1871, the government passed a resolution in the House of Commons that it "recognized its obligations to contribute towards its own defence from whatever quarter"

(Stanley, p. 241). "From whatever quarter" can be interpreted to include the usage of the civilian sector for training of its military personnel, or the contracting of vocational requirements to the civilian sector. In any case, Canada was now forced to fill the defensive gap left by the departing British soldiers. The most pressing need was to provide for a permanent garrison to look after the armaments and fortifications at Quebec City and Kingston. It was decided to organize two batteries of artillery which would not only be responsible for the maintenance of the defence works but would also function as schools of gunnery for the officers and men of the militia artillery. Using seconded British officers to set up the administration for the new gunnery schools, and British non-commissioned officers to provide the training, the schools of gunnery "within a few years provided the militia artillery with a core of well trained Canadian non-commissioned officers and gunners, which had not existed before" (Stanley, p. 242).

THE NORTH WEST REBELLION (1885)

The next major military test which demonstrated the lack of technical or vocational training of military personnel was the North West Rebellion of 1885. The Rebellion demonstrated the unpreparedness of the Canadian militia to engage in serious operations in the field. If it had not been for the cooperation (and profits to be made) of the Canadian Pacific Railway and the Hudson's Bay Company, it would have been extremely difficult to move and maintain the troops in their movements from Ontario to present day Saskatchewan. The Canadian government had to "hire civilian teamsters to move the required supplies and equipment; the Hudson's Bay Company to supply provisions; and the Canadian Pacific Railway to provide telegraphic communications back to Ottawa and transportation wherever possible" (Massey, p. 30).

It must be stated in fairness that the Canadian government was aware of the lack of technical or vocational training conducted by its military forces and the need for heavy reliance upon civilian contracted employment. In an earlier report, the Annual Report of 1880, the General Officer Commanding the Militia wrote about the "inefficiency of the militia personnel, the deterioration of equipment and the restriction of the period of training at camps. Musketry instruction was almost worthless in the absence of qualified instructors" (Stanley, p. 247). This lack of technical training was inherited from the British traditions. In the Egyptian campaign of 1882-1889, the British "hired Canadian lumberjacks, natives, and steamboat captains to operate their transportation systems on the Nile River" (Peel, 1972, p. 149). The nineteenth century idea and concept of a military person was to conduct warfare and to be supplied by civilian contractors or to live off the land. The nineteenth century saw the demise of the latter concept, the Canadian military being created at the same time when the ideal of a self-sufficient military force began to be discussed in the British military circles.

Even though the military hierarchy were aware and concerned over the lack of training needed in order to be a self-sufficient force, the logistics of supply in the North West Rebellion of 1885 demonstrated the lack of willingness or courage in a patronage driven system. In March, 1885, the Minister of Militia and Defence, Adolphe Caron, wired the C.P.R. superintendent of construction at Biscotasing to make arrangements to send soldiers through to Winnipeg. Besides sending troops, the Minister was also to furnish the force in the North-West with staff and services. In one case, apart from transportation by rail, the Minister borrowed "telegraphers from the Dominion Government Telegraph Service and from the Great North-Western Telegraph Company to provide communications with the forces in the field" (Morton, 1972, p. 38). Once again, this lack of concern over vocational training in order to create a professional structure was demonstrated by what has become known as the North Shore Trip, the movement of men and supplies from the civilized centers of Canada to the vast territory of what is now western Canada. The North Shore trip was the movement of troops to the north of Lake Huron and Lake Superior along a 400 mile route in which there were four gaps. The gaps amounted to 110 miles with rail being available for the remaining 290 miles. The troops were moved "in open railway cars in a Canadian winter with snow at a depth of five feet upon the ground" (Denison, p. 271). Food, when it was available, consisted of salt pork, biscuit, rancid butter and unsweetened tea. For men, who "only a few days earlier had been office clerks, shop assistants and factory hands, it was a rough introduction to the reality of nineteenth century soldiering" (Morton, p. 41). The absence of any vocational professionalism was also evident in the manner in which ill personnel were treated. Upon arrival at Winnipeg, a large number of men became ill with rheumatism and diarrhoea. Once again, the onus of responsibility was placed upon personnel utilizing their own resources; Lt. Col. Denison rented a house at his "own expense, put a wood stove in it, and turned it into a hospital" (Denison, p. 281) for his own men.

In all fairness to the study of this thesis, and in examination of the last century with regards to the concept of technology, it must be mentioned that military concepts of vocational training were slowly changing. It must also be emphasized that when one examines the problems of transportation of personnel and supplies in the Canadian campaigns, vast improvements within a short period of time had been accomplished. The expedition of 1870 to suppress the first Riel Rebellion was an overland adventure in which the 1,200 miles journey was completed, from Toronto to Fort Garry by the physical exertions of the military personnel without benefit of railway or prepared roads. A short 15 years later, the majority of the 2,000 miles journey to Regina with the exception of the North Shore trip, was completed by railroad. Thirty days after the North Shore trip was conducted, the remainder of the gaps were completed by the workers of the Canadian Pacific Railroad. All of the "veterans of the North West Rebellion were able to return home by railroad" (Morton, p. 44). In addition, travel on the prairies through the use of the South and North Saskatchewan Rivers from the small town of Medicine Hat to Saskatoon, to Edmonton, and down river to Winnipeg was made possible by a fleet of steamboats which during the North West Rebellion carried numerous tons of supplies and personnel. Twenty years later, the aeroplane was a technical fact and motorized vehicles were being used in increasing numbers as a mode of transportation hampered only by a lack of all season roads.

CANADIAN MILITARY MEDICAL SERVICES TO 1885

As an example of the increasing awareness of the need for vocational training, the beginning of military medical service must be examined up to the conclusion of the Boer War. The British traditions of medical care for their military personnel was primitive in comparison to the French military structure. France had a history of allowing religious orders to provide medical treatment which the Protestant British had removed from their culture by force in the sixteenth century. Long before any central military medical service was organized, the Commanding Officer of a battalion of the Sedentary Militia, following the British traditions of the Imperial regiments in England, appointed a local doctor as his surgeon-major. In civilian practice, no conditions existed for these medical personnel to receive training in military medicine. This can be further demonstrated by examining a photograph in Morton's **The Last War Drum**, of wounded soldiers from the North West Rebellion. Of the 41 men in the photograph, which included medical staff, 11 had their arms bound in slings. The number of damaged arms is more of "a testimony to the dangers of mounted warfare, and perhaps to the fact that more serious wounds tended to be mortal" (Morton, p. 141).

The Militia Act of 1855 provided medical attention for the new units of volunteers by appointing a local doctor as regimental surgeon; however, at this time medical organization and supervision, as well as training, was still lacking. In the first Riel Rebellion of 1870, when the expedition was a joint venture of British and Canadian troops, the medical staff "for the military force of 1163 all ranks, consisted of one regimental surgeon, three assistant surgeons from the British army and eight other ranks of the Army Hospital Corp" (Nicholson, 1977, p. 25). Having learned some valuable lessons in the Crimean War (1854-1856) with regards to the treatment of wounded and ill personnel, an Army Hospital Corp (A.H.C.) had been established. Training was still primitive to the current standards of health care, yet were comparable to medical treatment received by civilians at that time. In the 1870 expedition, base hospitals were set up in advance with a sergeant and a few other members of the A.H.C. to assist the surgeons. Sick men were returned to these hospitals by the returning empty supply wagons. Although Britain had abolished the regimental medical system by 1873, the system was retained in Canada as the only form of medical service available to the militia. The logistics of the North West Rebellion of 1885 with regards to distance and evolving medical viewpoints in the advantages of personnel training to provide better treatment, were recognized by the government in Ottawa. The Minister of Militia and Defence issued instructions in April, 1885, for a Medical and Surgical Department to be formed for service in the North West. The man chosen for this task was Lt. Col. Darby Bergin, a surgeon and militia officer. Bergin was no stranger to the reality of lack of facilities as he reported back to the Minister;

> There was no fixed Departmental Medical Staff, no Field Hospital or Ambulance Service, no organized Corps of Nurses, no fixed method of recognizing such societies as the St. John's Hospital Aid Society, the Red Cross, and other associations (Nicholson, p. 28).

Dr. Bergin ordered two field hospitals to be recruited, each with a complement of six officers as surgeons and assistant surgeons. The necessary dressers and orderlies were drawn from the graduating class and third and second year students of the medical faculties of universities in Montreal and Toronto. The ambulance corps was a voluntary Red Cross Hospital Corps, which had been organized in Toronto by a committee of citizens and equipped at a cost of $2,000 raised by public subscription. Before leaving for the North West Rebellion, the volunteers, "mostly all graduates in medicine or surgery, had been given a week's intensive instruction in first aid and stretcher drill" (Nicholson, p. 31). The importance of concentrating on the medical services provided during the North West Rebellion, and later with the Boer War, is to demonstrate that even though the Canadian military was continuing to use civilian professionals, it was the first example where these civilian volunteers were being concentrated into one occupational grouping in order to provide their expertise to the entire infrastructure. It was at this point, for the first time, that the military also utilized the professional services of female nurses. Shortly after his appointment, Dr. Bergin had recommended to the Minister of Militia the organization of a corp of nurses. The response was immediate and enthusiastic. Seven nurses were selected and arrived in Moose Jaw, Saskatchewan by the end of May, 1885. They were at once sent to work in a "newly constructed two-storey frame building which served as a base hospital for forty wounded invalids who had made the journey from Saskatoon by way of passage on the Northcote steamboat and then fifty miles over the prairies in springless farm wagons" (Nicholson, p. 33). Even though the services of the nurses was only required for one month before hostilities finished, it was the first time that female nurses had been officially recognized as forming part of a military force in the field. All of the patients in the two base hospitals, Saskatoon and Moose Jaw, were transported by steamboat or train to civilian care at the Winnipeg General Hospital.

CANADIAN MILITARY MEDICAL SERVICES TO 1914

Upon completion of hostilities, the Canadian government fell into the inevitable lapse of neglect with regards to military occupational training. It was the professionalism of the civilian medical services that continued to push for improvements for military medical services; however, it would be more than a dozen years before the traditional regimental surgeon would be relieved of the sole responsibility for the medical care of the Canadian militia. In 1892, medical doctors from the militia formed the Association of Medical Officers of the Militia of Canada with the following objectives:

1. The bringing of Medical Officers in closer personal relation, and the development of a Departmental esprit de corps.
2. For discussion of matters relating to the Medical Department of the Militia.
3. For the discussion of military matters from a medical point of view.
4. For reading of papers on Military Medicine and Surgery, Hygiene and Equipment (Nicholson, p. 38).

The association meeting also passed a number of resolutions calling for improvements in the status of medical services and the state of equipment, pointing out, that there was no stretchers or ambulances or any other equipment that a "modern" army medical service should be provided with. It was not surprising that within a short time, the General Officer Commanding Canadian Militia, Major-General Herbert, "forbid the association to hold any further meetings as the discussions were subversive to military discipline and the medical officer's duty was to obey, not to protest" (Nicholson, p. 39). At that point, the military association became dormant, but discussion continued at the civilian professional associations and medical doctors were held in much higher social regard by politicians and society than the troublesome trade unions of the same time-period.

There was no question that the medical service was in need of reorganization. The system of regiments maintaining their own hospitals, as they did in the North West Rebellion, still provided the only means of caring for the health of the military personnel. The challenge of the doctors was met by the military in 1898. A General Order, issued in March 1898, defined the duties of the newly appointed Director General of Medical Staff as including,

> The organization and administration...of the personnel, medical stores and equipment, hospitals and sanitation of the Militia and of the Units of the Permanent Corps and direction of Courses of Instruction for the same in Camps or Garrisons (Nicholson, p. 42).

In addition, vocational training of medical personnel was to be assisted through the appointment of a Principal Medical Officer in each Military District, responsible for the training of medical officers and hospital sergeants in camp. Further advances in this occupational training came in 1899 when General Order No. 62 established the Canadian Militia Army Medical Services which created the Medical Staff to be composed of "officers, and the Medical Staff

Corps, which was to be made up of all other ranks, to be especially enlisted and allotted to serve in bearer companies and field hospitals" (Nicholson, p. 43). This specialization with regards to recruits being "especially enlisted and allotted to serve" was a strong indication of the beginning of the realization that required specialists also required specialized training for that occupation. While the training was still limited in terms of actual needs, it was specialized training, something which had not existed in the past 40 years of the Canadian military. During the winter of 1899-1900, volunteers were recruited for bearer companies and field hospitals located at several bases across Canada. The establishment for a Canadian bearer company called for three medical officers and 61 other ranks, equipped with 10 ambulance wagons. A field hospital of 100 beds had four medical officers, a quartermaster, and 40 men. Necessary transport was still provided by civilian contract. Training was authorized on a basis of 12 days a year. In addition, the 1900 summer camps provided courses of instruction for qualification to the rank of Major for medical officers.

The decision to send volunteer troops to the Boer War in 1899 coincided with improvements for the specialized vocational training of medical personnel. The organization of a Canadian Nursing Service, which had been promised in 1899 when the Army Medical Department had been created became a reality in August, 1901. The Commander of the Canadian Militia, Major-General O'Grady-Haly, gave approval for cadres of a nursing service to be inaugurated with Canada's military forces and for "positions to be offered to these nursing sisters, one of whom was Nursing Sister Georgina Pope, a veteran of the North West Rebellion, currently serving in the Boer War and destined to become the first Matron of the Canadian Army Medical Corp" (Nicholson, p. 51).

In July, 1904, General Order No. 98 announced a general reorganization of the medical services. This General Order cancelled all existing regulations and created a new organization; the Army Medical Corps. This organization was divided into two components: a small Permanent Active Militia Army Medical Corp with the purpose of staffing for permanent station hospitals and a Non-Permanent Active Militia Army Medical Corp designed for field units. In addition to the personnel of the bearer companies and the field hospitals, the non-permanent element also included dental officers as well as additional nursing sisters. At the same time, the field ambulance was confirmed as part of the service personnel. It combined the functions of the bearer company and the field hospital which would now be carried out in the field ambulance. The overall advantage of this was the "discarding of the iron cots and heavy marquees of the old field hospital which allowed for considerable flexibility and mobility in the new units" (Nicholson, p. 59). Considering that the medical profession was still considered by many to be more of a cure profession than a preventive profession, this reorganization was radical in its concept as the medical staff also trained in sanitation and other aspects of hygiene in order to provide healthier environments for personnel in their care. By such means of training, when the orders came for mobilization in 1914, the medical services could call upon a highly trained cadre of professionals, familiar with the problems and difficulties of the Service and competent with the technology of its times to be able to accomplish as much as it could.

The medical branch of the Canadian military had the fortune to be considered a separate profession with a perceived higher social standing than most other occupations. For that reason, medical officers were able to make demands as civilians in order to better their positions as military officers, and their demands encouraged the military to require occupational training for all other elements of the medical services.

The remainder of other military occupations were not given serious occupational training until the demands of the increasing technology of the twentieth century and the First World War created situations where occupational training was required for daily operations. From the time of the North West Rebellion until the beginning of the twentieth century, the Canadian military was confined to the limited training of personnel through the gunnery schools and the Royal Military College. The military, to a large extent, was viewed by its members and by the public as a social club which demanded only interest in military grandeur, fancy dress uniforms and a physical presence at civil functions. There was also a lack of professional concepts among the officers and other ranks of this organization. It can be said, and this will be expanded in a future chapter, that it was the arrival of electrical technology that created the technical and vocational training of the military. Until the military began to use, on a daily basis, the effects of this new technology, there was no need to consider vocational training. The prevailing attitude was that anyone could cook meals for military personnel provided they were supplied with smoked or fresh meat, bags of flour, some salt and water, and whatever fresh vegetables could be obtained from civilian suppliers. The military did not view itself as an infrastructure as it had not attained any professionalism at this particular time.

In addition to the Army Medical Corps, even though used as the prime example in how vocational training was slowly utilized in the Canadian military, other military organizations which required specialized occupational training were also, albeit slowly, obtaining their deserved recognition by the infrastructure.

MILITARY ENGINEERS

The Corps of Engineers were raised in 1861 and had been on active service since the Fenian Raids of 1866. While the officers of the Corps were trained as civilian engineers, the bulk of their assignments with regards to other ranks did not require specialized occupational training. All troops, at various times, could find themselves building bridges, constructing scows on the North Saskatchewan River, or filling in the rut tracks and pot holes of Canadian roads in order to facilitate easier movement of field guns. An examination of the strength and deployment of the Active Militia in each of the 12 military districts of Canada in 1885 showed a non-existence of organized units designed to provide occupational or vocational services. Of a total of 36, 645 personnel on the "lists" in 1885, only 179 were designated as engineers (Stewart 1962A, pp. 6-17).

VOCATIONAL IMPORTANCE OF PIONEERS AND THE SIGNALS COMPANY

A partial answer with regards to the maintenance of daily vocational requirements would be found by examining the role of the Pioneers in the Canadian military. The Pioneers were a small section of regimental artificers, considered competent to repair barracks, furniture, utensils or to do minor mechanical work in barracks or camp. The important attribute required of the Pioneers was their "ability to instruct others to complete assigned tasks" (Otter, 1914, p. 75). Otter (1914) continued to examine the role of the Pioneer in **The Guide: A Manual for the Canadian Militia** by stating:

> Each Company should have one pioneer, and the distribution of trades in a Battalion of eight companies be as follows: two Carpenters; two bricklayers (one able to plaster, the other to slate); one Smith (able to shoe horses); one Stonemason; one Painter and Glazier; one Plumber and Gas Fitter (p. 76).

The importance of this section of Pioneers was that they were to instruct others in the vocational trade. In addition they were to possess a "proper outfit of tools" and the Sergeant in charge of the section should be "a carpenter if possible" (p. 76).

As Major-General Sir William D. Otter published this guide in 1914, it is a given testimony on the role of personnel who were responsible for vocational maintenance and occupational trainings prior to the reorganization of the Canadian military in the decade before the First World War. In examining the General Staff's **Field Service Pocket Book** (1913) with supplements of April, 1914, which was a required possession and reading by all officers, the role of pioneer had disappeared by 1914 from the war establishment of various units, (pp. 10-12) being absorbed into the Ordnance or Engineer Corps. Table 1, page 77, provides the limited numbers of mechanical vehicles allotted to various divisions within the Canadian military infrastructure. The Canadian military infrastructure prior to the First World War was very similar to its British counterpart with minor deviations. From Table 1, it is possible to observe the continued dependence by the military upon horses for transportation of the majority of supplies and weapons. The acceptance by the military regarding the technology available of motorized vehicles with all of its vocational maintenance requirements was evident through the limited numbers that were available to certain units, particularly the Signal Service.

Table 1

War Establishment of Various Units (1914)

WAR ESTABLISHMENT OF VARIOUS UNITS (1914)

UNIT	PERSONNEL	HORSES	WAGONS	MOTORIZED VEHICLES
CAVALRY	941	1,045	33	0
HORSE ARTILLERY	1,454	1,671	165	0
FIELD ARTILLERY	1,670	3,106	363	0
HEAVY ARTILLERY	198	144	18	0
TRANSPORT & SUPPLY	786	695	262	7
FIELD AMBULANCES	575	223	64	0
SIEGE ARTILLERY	1684	800	118	0
ENGINEERS	814	768	104	0
SIGNAL SERVICE	979	1,810	76	10
INFANTRY	1,333	97	29	0

General Staff, War Office. (1914). **Field Service Pocket Book 1914**. pp. 8-10.

The new technology with regards to communications was also utilized by the military in the years preceding the First World War. With the introduction of wireless communications, the military now required through the authority of the **Field Service Pocket Book** (1913) a Signals company to accompany each infantry division. The required equipment for the Signals company included "3 cable detachments having 38 miles of cable and 9 vibrator offices, 4 mounted men [horses], 16 bicyclists, 9 motorcycles and 10 portable telephones" (p. 53). Again, it must be assumed that wireless communications personnel had a basic working knowledge of electricity, obtained through civilian employment prior to enlistment or taught in the military under the instructions of skilled NCOs.

SUMMARY

The creation of the Canadian military establishment has been one of several important elements in the development of Canadian society, even though this role has often been misunderstood and under-emphasized by authors of Canadian history. From the time of Confederation until the beginning of the twentieth century, the Canadian government choose not to utilize available technical innovations in order to improve the professional status of the military. The technological and vocational training were limited in scope and thought of in terms of military aggressive warfare only. The role of the soldier was to fire his weapon upon receiving orders by those who were his social betters. Such a role did not include serious consideration for the training of bakers, cooks, medical support, or personnel involved in the transportation and requisition of supplies. The government viewpoint was that civilian contractors would supply the military with the majority of vocational or technical requirements. This was a direct throwback to the British traditions and the colonial expectations that the civilian mercantile sector would provide whatever was requested and in return would receive much needed payment from the military. The technical and vocational role was also down-played by the Canadian government in the belief that Great Britain would protect Canada with military reinforcements in the advent of any military hostilities. This policy was confirmed until the Imperial troops began to be pulled out of Canada shortly after Confederation. Within 30 years, it would be the Dominion forces that rallied to the cause of Great Britain. The final conclusion is that prior to 1914 the peacetime environment of Canada with regards to its military did not require technical or vocational training as long as military numbers were kept limited. It would only be in the advent of a hostile environment that the Canadian government and the military would began to adopt extensive technical and vocational training in order to maintain its organization.

The lessons taught to the British military establishment by the Boers of South Africa in 1899 were not ignored by the Canadian participants of the same conflict. In order to subdue a mobile enemy, the British were forced to change their organization in order to become more extremely self-reliant for the entire time that they spent on active duty outside of garrisons. The methods employed by the British in South Africa became the standards the Canadian military would adopt in the beginning of the twentieth century and which would effectively serve them in the First World War. The rapid changes in technology in the final years of the nineteenth century also demanded a change in the procedures used by the Canadian military. With electricity came the need for soldiers to understand and be able to maintain or repair any electric fixtures. The first X-ray machine for military use was used by the British in the Boer War (James, 1985, p. 276). It is this photograph of the X-ray machine in use that sums up the entire concept of the need for advanced technical and vocational training of personnel. It is not to be implied that Canadians lacked innovative skills in the development of technology. The photograph of the bones of a human hand in 1896 at McGill University is one of the first X-rays taken in Canada (Abbott, 1990, p. 471). Technical and vocational training of military personnel began with the twentieth century. One reason is that technology could be mobile; from this point onwards the military establishments could utilize it on military campaigns. The new century and its mobile technology would now require the specialized training of personnel who must accompany it in its movement.

CHAPTER IV

OVERVIEW OF TECHNICAL AND VOCATIONAL TRAINING TO 1968

INTRODUCTION

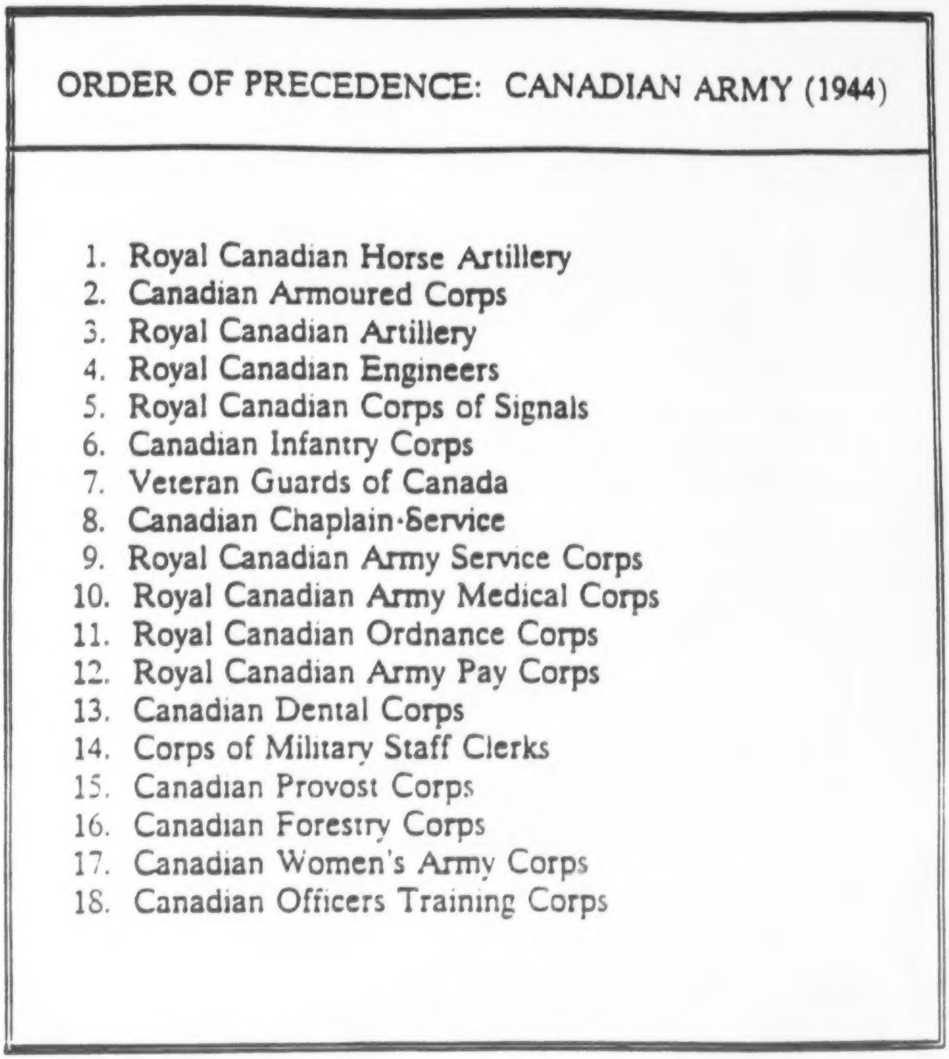
The contents of Chapter IV continues with an overview of the creation of certain specialized Corps that provided technical training for its personnel. This chapter will be divided into two sections; the first section a descriptive survey of technical training in certain specialized Corps and the second section an examination of the extensive "retraining" of military personnel prior to returning to civilian roles at the conclusion of the two World Wars.

GENERAL OVERVIEW

In every army there are a host of auxiliary services which contribute in a variety of ways to the upkeep and welfare of the front line troops. In the First World War, it was estimated that for every fighting soldier there were four men behind the lines providing "technical or vocational maintenance or operations" (Wallace, 1919, p. 35). In 1944, the Precedence of Corps in the Canadian army listed 18 specialized divisions of skilled labour. Of these 18 Corps, only four were involved in active duties as frontline troops. The remainder were all service industries, supplying skilled technicians or vocational services within the military infrastructure. Table 2, page 82, shows the order of precedence for the Canadian army as of 1944; Table 3, page 83, provides alterations in 1964 prior to Unification.

Table 2

Order of Precedence: Canadian Army (1944)



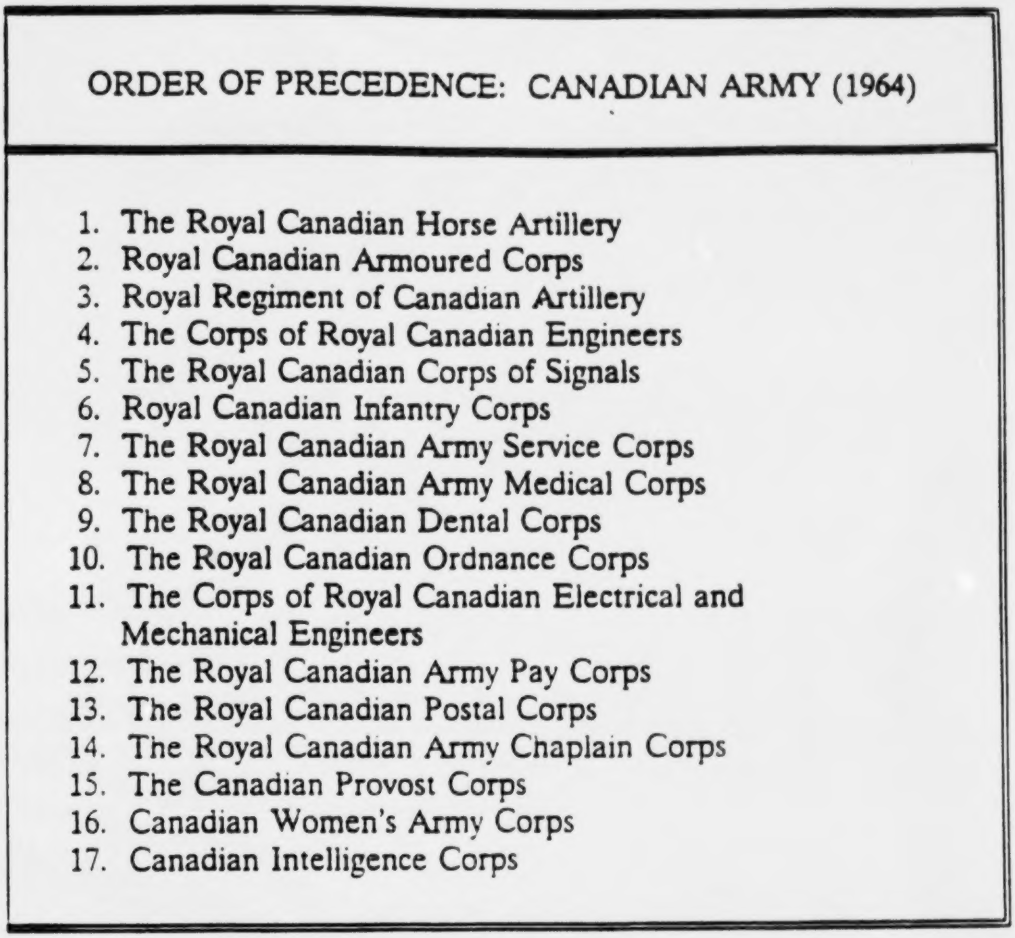
ORDER OF PRECEDENCE: CANADIAN ARMY (1944)

1. Royal Canadian Horse Artillery
2. Canadian Armoured Corps
3. Royal Canadian Artillery
4. Royal Canadian Engineers
5. Royal Canadian Corps of Signals
6. Canadian Infantry Corps
7. Veteran Guards of Canada
8. Canadian Chaplain Service
9. Royal Canadian Army Service Corps
10. Royal Canadian Army Medical Corps
11. Royal Canadian Ordnance Corps
12. Royal Canadian Army Pay Corps
13. Canadian Dental Corps
14. Corps of Military Staff Clerks
15. Canadian Provost Corps
16. Canadian Forestry Corps
17. Canadian Women's Army Corps
18. Canadian Officers Training Corps

Precedence of Corps. (1944). **Canadian Army Training Memorandum** No. 41. p. 48.

Table 3

Order of Precedence: Canadian Army (1964)



ORDER OF PRECEDENCE: CANADIAN ARMY (1964)

1. The Royal Canadian Horse Artillery
2. Royal Canadian Armoured Corps
3. Royal Regiment of Canadian Artillery
4. The Corps of Royal Canadian Engineers
5. The Royal Canadian Corps of Signals
6. Royal Canadian Infantry Corps
7. The Royal Canadian Army Service Corps
8. The Royal Canadian Army Medical Corps
9. The Royal Canadian Dental Corps
10. The Royal Canadian Ordnance Corps
11. The Corps of Royal Canadian Electrical and Mechanical Engineers
12. The Royal Canadian Army Pay Corps
13. The Royal Canadian Postal Corps
14. The Royal Canadian Army Chaplain Corps
15. The Canadian Provost Corps
16. Canadian Women's Army Corps
17. Canadian Intelligence Corps

Stewart, C. H. (1962A). **The Concise Lineages of the Canadian Army: 1855 to Date.** p. 135.

Foremost among these auxiliary services in terms of technical training was the Royal Canadian Medical Corps, which has been examined in the previous chapter. This research has used the example of the Royal Canadian Medical Corps as the major example of the evolution of technical training prior to the First World War. In order to provide a well rounded descriptive study, other examples will be utilized to demonstrate technical and vocational training from the First World War to the unification of the army, navy, and air force elements in 1968. The Royal Canadian Ordnance Corps (later the RCEME) will be given special consideration as the major example of technical training from the First World War to its dissolution in 1974. Additional examples which will demonstrate the specialized training requirements are the Canadian Army Dental Corps, the Canadian Overseas Railway Construction Corps, and Canadian Forestry Corps.

CANADIAN ARMY DENTAL CORPS

When the First World War commenced in 1914, there was little provision made by the military for the dental requirements of military personnel. As hostilities dragged on, it became apparent, that if the efficiency of the soldier was to be maintained, dental care would be required. For this purpose, a large number of dental officers were recruited and by February, 1915, each "infantry brigade, calvary brigade, larger medical units and other formations had a dental laboratory with full working equipment"

(Wallace, p. 36). It is interesting to note that Wallace makes no mention of dental assistants or dental technicians responsible for the manufacturing of artificial teeth, or the preparation of patients for general or reconstruction surgery. At the end of hostilities, the Dental Corps ceased to operate as a distinct unit. Upon mobilization in 1939 the Canadian Dental Corps returned as a reorganized form, not spontaneously, but rather through the result of "years of careful planning by the profession, notably the Canadian Dental Association" (Canadian Dental Corps Serves Three Arms, 1945, p. 7). This is an interesting comment on the lack of technical training provided by the Canadian military during the years between the two World Wars, and like the Canadian Army Medical Corps in the long years between the North West Rebellion and the formal organization in 1904, technical training survived because of the efforts taken by the civilian professional associations to be prepared for events like war.

The Canadian Dental Corps, in the midst of the heavy demands placed upon its facilities and personnel, was able to provide technical training for its personnel during the Second World War. New techniques and advancements in treatment methods were continually brought to the attention of Dental Officers through the facilities of its Technical Training Centres. Dental officers, technicians, and dental assistants were brought to these centres in London, England or Toronto for "specialized refresher training" (p. 9).

CANADIAN OVERSEAS RAILWAY CONSTRUCTION CORPS

An interesting auxiliary service of the Canadian army during the First World War, and which demonstrated the dependance by the Canadian military upon civilians, was that of the Canadian Railway Troops. Rapid transportation of supplies to the front lines was of prime importance in addition to the need for trained technical troops to rebuild the bomb destroyed railroads. The task of organizing this body of men was assigned by the Canadian government to Lt. Col. J. Stewart who combed Canada for efficient railway workers possessing technical skills. "These men were then formed into the 239th Overseas Railway Construction Corps" (Cooper, 1920, p. 292). Often these railway men completed their construction work exposed to the full fire of enemy guns without having the satisfaction of being able to return the fire, depending instead upon regular troops for protection. By 1918, the Canadian Overseas Railway Construction Corps included the "58th Broad Gauge Operating Company, the 13th Light Railway Operating Company, the 69th Wagon Erecting Company, and the 85th Engine Crew Company" (Cooper, p. 294). The company titles described the technical and vocational requirements. In addition, the military brought over Canadian Pacific Railroad locomotives and other rolling stock to be "operated and maintained by recently recruited C.P.R. troops" (Wallace, p. 37). The Corps were disbanded after hostilities ceased; however, 20 years later the services of this vocation and its machines would be required again.

The perceived threat of a Japanese invasion of British Columbia in 1942 and the supposed danger to Prince Rupert which was a large American and Canadian supply base required the creation of No. 1 Armoured Train. This armoured Canadian National Railroad locomotive and rolling stock patrolled a single line of track running 150 kilometers from Terrace to Prince Rupert, British Columbia. The personnel component of the train was made up of "Royal Canadian Artillery gun crews, with an infantry rifle company, a small headquarters with signallers and a medical staff. The technical aspects of skilled tradesmen were provided by C.N.R. through a regular civilian crew which operated the locomotive" (Grimshaw, 1991, p. 41).

CANADIAN FORESTRY CORPS

Another unique formation of trained civilians that was required by the Canadian military during the First World War to fulfill a military need was the Forestry Corps. The formation of this corps came about through the growing shortage of shipping as Canadian lumber for the war effort required a large percentage of cargo space that had to be utilized for badly needed war materials or food products being shipped to England or France. A special force of Canadian lumbermen was "requested by the British for assistance in the production of lumber for military purposes from forests in Scotland and England" (Cooper, p. 288). The first unit to arrive in 1916 carried with it all the machinery necessary and immediately established a lumber camp and saw mill in England. Within a few months, additional battalions were created and sent to France to harvest additional forests to satisfy a never ending demand for lumber. As Wallace states:

> Lumber was needed for the construction of dugouts for the making of the trench-mats without which life in the trenches became a slough of despond, and for the manufacturing of railway ties. In addition, it was required for the building of the multitude of huts that sprang up behind the lines and in the reserve camps hospitals, aerodromes, Y.M.C.A. canteens, offices, store-rooms, rest huts, bath-houses (p. 37).

The officers and men of the corps were recruited from all parts of Canada with special effort made to "allot men to forests that were similar to their civilian lumberjack skills" (Cooper, p. 290).

With the advent of hostilities in the Second World War the British again turned to the Canadian government and requested assistance for forestry units to operate in Scotland and possibly in France. One of the misconceptions in the twentieth century is that of the role of lumber with regards to technology. As the editors of **CATM No. 58** recorded in January 1946; "In the days of tanks and guns, battleships and bombers, popular imagination tends to seize upon steel as the one great raw material of modern warfare; the importance and value of wood is sometimes overlooked" (Canadian Forestry Corps Wins its Battles, p. 6).

Once again, it was the technical skills of vocational civilians, recruited from across Canada that supplied the military with lumber products in order to construct "hangers, barracks, docks, certain types of aircraft, patrol vessels, and motor torpedo boats" (Canadian Forestry Corps Wins its Battle, 1946, p. 6). The Corps began the Second World War with the advantage of having among its officers, men who were not only connected with the lumber industry in Canada but who also possessed the knowledge and expertise of timber conditions overseas. An example of this type of promotion of skilled personnel was that of "Major General John White, who had commanded the Canadian Forestry Corps in France during the First World War" (p. 7).

ROYAL CANADIAN ORDNANCE CORPS (RCOC)

In addition to the pioneers providing technical and vocational assistance to the units they were attached to prior to the First World War, there was another corps which had its beginning in the British military structure dating back to the Middle Ages. This was the Ordnance Corps. This long established corps was responsible for the technical skills required for the maintenance of weapons. In Canada, this corps started as a civilian Stores Company. The Ordnance Corps became a military body in 1903, charged with equipping all military personnel and providing any required technical skills for the maintenance of weapons, whether they were bayonets or howitzers.

Ordnance self-sufficiency, hard pressed as civilian personnel during the North West Rebellion to provide the military forces with all requirements towards obtaining equipment and supplies, took a step forward in 1894 when a harness and saddlery repair shop was established at Toronto and new equipment arrived from England for making ammunition at the cartridge factory. In addition, "two expert armourers were brought over from the Imperial service in England and took their place with the Stores' staff" (Rannie, 1984, p. 31).

In 1903, the Stores company was reorganized as the Ordnance Stores Corps, with another name change in 1907 to the Canadian Ordnance Corps. Ordnance personnel made much of their innovative and technical skills in the decade prior to the First World War. In 1910, Ordnance personnel carried out their first maneuvers by mechanical transport in order to demonstrate the effectiveness of trucks in terms of time and load capacity over horse drawn transports. By 1912, wireless telegraphy stores became part of Ordnance supply with most detachments being composed of "small workshops with personnel trained as armourers, saddlers, wheelwrights, and blacksmiths" (Rannie, p. 35). It was a time of conflicting technology, the Ordnance Corps being required to provide skilled technicians for the maintenance of mechanical vehicles plus electricians for the new methods of communication; and at the same time, being required to provide blacksmiths and other skilled vocational personnel for the traditional remnants of a passing age.

During the First World War, the Canadian Ordnance Corps were responsible for the maintenance of the weapons. In order to maintain and to provide repairs of the various guns, field, heavy and siege, plus horse transport vehicles of all kinds, there were two Corps Light Ordnance Mobile Workshops and a Medium Ordnance Mobile Workshop. Each workshop had an "Inspector of Ordnance Machinery with a staff of artificers, turners, fitters, hammermen, wheelers, et cetera" (Rannie, p. 40).

The daily tasks of the Armament Staff Sergeant and the men under his command were fast paced. The journal of Warrant Officer 1, George Farlie, dealt with "technical jobs performed in the mud at the gun sites; replacing parts and checking tolerances, cannibalizing damaged guns to maintain working guns in action, instructing gunners on the setting of sights, and undergoing constant frustration with the unavailability of replacement parts" (Rannie, p. 40).

George Stanley comments in **Canada's Soldiers** that:

> It is almost a national tradition in Canada that active participation in a war should be followed by a rapid decline of interest in military matters and a corresponding decline in the efficiency of defence forces (p. 340).

The years between the First World War and the Second World War demonstrated two aspects in the technical and vocational training offered by the Canadian military. The first aspect was concurrent with the opinion of Stanley and other military historians; the Canadian government saw little value in maintaining large numbers of military personnel when there was no immediate use for them. The second aspect, regardless of the military down sizing, was the realization that twentieth century technology was mechanical or electrical in nature and any technical training should support the technology utilized. In that regard, the days of calvary and all requirements for remounts came to a slow conclusion by 1939.

The Canadian Ordnance Corps was down sized in a drastic manner similar to all other units of the Canadian military shortly after 1919. The Ordnance Corps utilized the postwar years by training their personnel in mechanical requirements. As early as 1909, there had been a "training depot responsible for training officers and men to the proper methods of a modern Ordnance depot" (Rannie, p. 275). Twice as many skilled tradesmen were graduated each month at the peak of the war effort at the British Ordnance schools as there were total officers and men in the Corps in 1939. In the between-war years, small numbers of Ordnance personnel were sent to Britain for training. Typical instruction included artificers and Ordnance Mechanical Engineers courses taught at the Royal Military College of Science in Woolwich. Most of the training, however, "was geared to static depot or camp operations concentrating on accounting and storekeeper functions as well as workshop trades training and procedures" (Rannie, p. 275).

In addition, the Royal Canadian Ordnance Corps at Camp Petawawa was given the responsibility for training personnel in all trades. By 1940, it had become the largest technical school of any branch of the Canadian Army to train tradesmen and officers. An Ordnance recruit first had to complete 10 weeks of basic training before proceeding to trade courses. After specialist training, which varied in length of time according to the speciality, there would come a further two weeks at the Ordnance School to learn proper procedures for maintaining Ordnance supplies and materials. Some courses in the Ordnance Mechanical Engineering training "took as long as thirty two weeks to complete" (Rannie, p. 277). In addition, the training offered to personnel covered "all trades concerned with supply, mechanical and electrical engineering, printing, and industrial gas production" (Rannie, p. 278).

With the commencement of the Second World War, the Canadian military once again found itself ill-prepared to cope with the basic supply needs of the military, let alone technological advances. The Canadian army was small, inadequate, and equipped with weapons and military stores that were left-overs from the First World War. Upon mobilization, the Ordnance Corps expansion of services required the appointment of many civilians with expertise in administration, procurement, and supply. Executives from large merchandising firms and technical experts from industry were in demand by Ordnance. Once again, the military found it more convenient to recruit trained or skilled civilians to supplement military requirements; however, it is only fair to state that the trained and skilled officers and other ranks who were part of the between-war regular army were utilized quickly in other positions where their expertise was required. As Rannie states:

> The T. Eaton Company, the Robert Simpson Company, General Motors and Ford, all were drawn upon heavily. A top executive of the Hudson's Bay Company... became Master General of Ordnance...to be followed a year later by a publisher....These men were not professional soldiers, but without their technical skills, experience and dedication to the cause, the Corps simply could not have achieved the successes it did (p. 64).

In 1943 the Royal Canadian Ordnance Corps were reorganized as the Corps of Royal Canadian Electrical and Mechanical Engineers (RCEME) upon realization that "formerly the engineering side of the RCOC had been small compared to the stores side, but, by 1943 in the Canadian Army Overseas the situation was reversed, with two-thirds of the greatly expanded RCOC being engineering" (Johnston 1983, p. 167). The ability of RCEME to maintain the vast mobile structure upon which the military depended, whether repairs and maintenance were conducted in front line conditions or rear line workshops, said a great deal for the innovative skills and experience of the skilled craftsmen. This was demonstrated by the emphasis placed upon technical upgrading of personnel in order to ensure the success of RCEME in meeting its military obligations. The success of RCEME, in addition to it being an effective organization, was also dependant upon the trades skills of individual craftsmen. Even though trades training was often "a rather informal and unstructured arrangement in front line units" (Johnston, p. 73), there was always a nucleus of experienced tradesmen around to guide the less skilled and less experienced tradesmen. In addition, there were occasions when trade experienced civilians would provide additional training. For example, in one session, "two civilians from General Motors gave a two-day presentation on servicing the hydramatic transmission in the General Stuart light tanks which were powered by Oldsmobile engines. In addition to sessions, rotation of mechanics through the rear area workshops, trades training, and trades testing was also used to maintain trade skills" (Johnston, p. 73). However as one officer commented, "a tremendous asset was the civilian experience of the many mechanics who had come from prairie farms where they had to be handy in a number of skills" (Johnston, p. 73).

RCEME was also instrumental in the establishment of upgrading courses for personnel through its Education Training Program prior to the conclusion of the Second World War. This program which enabled personnel to upgrade technical skills to assist them in civilian life upon demobilization or in rank promotion for career soldiers will be expanded further in this chapter.

The trades training of personnel at military bases in Canada during the Second World War was more formalized than similar training conducted overseas. Recruits came to the Ordnance and later RCEME training centres from recruiting depots. All recruits had to successfully complete a ten-week military training course. From this group, those selected for technical training proceeded to Hamilton, Ontario, or London, Ontario. In response to an increasing demand for skilled soldier-technicians, the Canadian Technical Training Corps was established in 1943. This Corps was composed of males of 17 to 18 years of age undergoing basic and trades training which could be completed by age 19 when they would be eligible for service overseas. A typical training course was "comprised of one month of general military training, three months of technical orientation training, six to ten months trades training, and finally, two months driving and maintenance training" (Johnston, p. 97).

RCEME SCHOOL

Once again, in 1945 as in 1918, RCEME prepared for a peacetime environment with decreased numbers of personnel. Trade upgrading training was begun immediately for remaining personnel. Officers returning from overseas were sent on refresher courses in procedures. The Royal Canadian Electrical and Mechanical Engineers School, located at Kingston Ontario, was responsible for general military training of recruits, trades training, instructor training, and officer qualification courses. The School was "designed to train up to a maximum of 422 tradesmen at one time" (Johnston, p. 183). As the trades training courses reached capacity, RCEME was able to send "seventy tradesmen a year to a variety of Canadian Vocational Training Schools facilities across the country" (Johnston, p. 184). The philosophy of technical training, according to instructor Sergeant Snell:

> was not basically learning particular equipments. Types of systems, how to recognize them and types of adjustments in each were taught. A case in point; on vehicles of that day, brakes were of three basic types. With knowledge of these three types of designs, a trained mechanic could take any piece of equipment and having knowledge of field expedients, make it work (Johnston, p. 184).

By the late 1950's, the RCEME School had established a reputation for a high calibre of technical training, insuring that the training carried out enabled the Canadian Army to meet any commitments, particularly those from the Korean War or United Nations Peacekeeping duties. The School went through several reorganization changes, "a major one in 1968 when the Royal Canadian School of Signals and the RCEME School were amalgamated and became known as the Canadian Forces School of Communications and Land Ordnance Engineering" (Johnston, p. 185).

APPRENTICE TRAINING PLAN

An Apprentice Training Company was added to RCEME in the late 1950's to provide both secondary academic and basic military training. The aim of the plan was to train selected personnel as soldier-tradesmen and to provide them with the required educational standards to enable them to advance to the ranks of senior non-commissioned officers (NCO). The Apprentice Training Plan was designed to be the "NCO's version of what the military college system was to the officer classifications. It survived until the autumn of 1967" (Johnston, p. 188). Most of the graduates of this Apprentice program later earned "rapid promotion to senior NCO ranks while other graduates obtained commissions to officer ranks through the Officer Candidate Program" (Rannie, p. 279).

Academically, the aim of apprentice training was to give the candidate a two grade increase in his formal education from a minimum of Grade 8 Ontario equivalent. As the Senior Academic Instructor, Mr. P. Edwards, said in 1959:

> The odds are against anyone becoming a good technician who has a poor academic background. A good technician is more of a changer of spare parts, a good technician should be able to diagnose causes of failure and be able to recommend modifications to prevent further failure. To do this, the technician must understand the principles underlying his trade; this is the so-called academic field (Johnston, p. 189).

Although the courses taught were recognized by the Canadian Army and the Ontario Department of Education, those who wished formal recognition of their academic efforts in the form of a Secondary Education certificate required additional courses through attendance at a night school. The apprentice program was of two years duration; with trade training commencing in the first year and being the major focus of the second year. As there were more training days available, the apprentices had the advantage of additional depth and breadth of trades training. This meant that "there was plenty of time to grasp both the theory and practical sides of each trade" (Johnston, p. 189). The program, however, was closed in 1967 as an economic measure by the military. One speculation on its closing by this researcher is that the Apprentice Training Plan had completed its objectives of increasing the formal educational level of its candidates. This will be reinforced in Chapter V with the examination of the socio-demographics of recruits in the late 1960's which demonstrate the higher educational levels of recruits at that time.

THE KHAKI UNIVERSITY AND EDUCATIONAL UPGRADING

One forgotten component of the Canadian Expeditionary Force of the First World War was the role played by the Young Men's Christian Association (Y.M.C.A.) with regards to the post war training of military personnel. In the British and American armies, the Y.M.C.A. was a civilian adjunct to the military forces. In Canada, it was "part of the army with Y.M.C.A. officers holding honorary commissions and being subordinate to military discipline" (Wallace, p. 38). The purpose of the Y.M.C.A. serving with the overseas combatants was to provide the rudiments of rest and recreation to personnel on leave from the front lines. This was achieved by providing canteens, entertainment, and organized sports.

In addition to providing for the physical relaxation of personnel off front line duties, the Y.M.C.A. was largely responsible for the creation of what became known as the Khaki University of Canada. According to Wallace the purpose of the Khaki University, or to give its full official designation, the Educational Service of the Overseas Military Forces of Canada, was "to give to the citizen soldier a training in the arts and sciences of peace" (p. 38). The Khaki University came into existence in base camps where soldiers waited prior to moving up to the front lines. The idea became popular and soon teaching centres had been established in practically all the Canadian centres in England, and the University of Vimy Ridge was organized at the front lines in France. At the Khaki University, everything was taught for which a class and a teacher could be found, "from Greek prose to commercial arithmetic" (Wallace p. 38).

There are two possible rationales behind the creation of the academic upgrading for the soldiers of the First World War. The first notion from the political viewpoint is that of the concern for returning disabled soldiers when hostilities ceased. The federal government in Ottawa had been preparing since 1915 to deal with the re-education of veterans with the hope of avoiding the pension evil that would fall upon the government to support disabled veterans unable to support themselves or their families. The Department of Soldiers' Civil Re-establishment, not only operated hospitals, nursing homes, and tuberculosis sanatoria, but it also developed elaborate plans for the retraining and placement of disabled soldiers in jobs. The viewpoint of the government was that "productive employment would be a veterans' benefit that would long outlast public generosity. For the able bodied, the best cure for the army-bred diseases of idleness and dependence was a full doze of self-reliance" (Morton, 1992, p. 166). The key word in the above phrase is "army-bred". This was reinforced by a British Army Order of November 1918, in which "educational training could no longer be regarded as a secondary consideration and as much time as could be made available should be devoted to it" (Historical Note on Army Education, 1946, p. 31). The viewpoint of the British was identical to the Canadian viewpoint:

> that even the most active and intelligent minds had immediate need of new occupations to fill the vacuum caused by this sudden emptying of effort. The other necessity was to set heads and hands feeling after the forgotten skill of civilian occupations (p. 32).

The second notion in providing additional education for military personnel is that of psychological control of a large group of personnel who had been removed from the relative security of civilian existence. Army education schemes were "impelled by stalemate at the front, boredom in hospitals, and altercations at camps" (Boshier, 1985, p. 17). The idea of providing additional education to military personnel during hostilities did not exactly become a priority for the military organization. According to Boshier, when Lord Gorell, Director of Education in the British army, suggested using the Canadian scheme for educating soldiers, he was accused of being a "Bolshevik" (p. 18). The idea of educating soldiers was still a radical concept, particularly, when the traditional viewpoint of soldiers was to teach them to kill, and as the war became more gruesome, the rationale behind military training was to drive out personal qualms and replace them with simple "blood lust" (p. 18).

Three things assisted in changing this viewpoint. First, hospitals and camps became clogged with soldiers who expressed an interest in learning and had a great deal of time to waste before they returned to active duty. Second, educators in Khaki, notably the Y.M.C.A. officers, pressed for the creation of army education schemes. This was in addition to their expected roles of providing recreation and entertainment for off-duty personnel. The third reason, according to Boshier (p. 18) was the most significant. The mood of the soldiers exposed to the harsh physical reality of life in the trenches and excessive casualties had shattered many Victorian concepts of appropriate behavior in society. The mood of the allied soldiers was ugly; the Russians had a revolution which effectively removed them from the war, French troops had mutinied, trade unionism was growing in the civilian sector, and military authorities, especially British and Canadian, looked at education as a solution to providing the discipline required for the hundreds of thousands of men in uniform.

POST SECOND WORLD WAR

During the Second World War, the emphasis of the Canadian military with regards to the further education of its personnel was mainly directed toward effective vocational and technical training in order to maintain the effectiveness of the infrastructure. With the realization in 1945 that the military campaigns in Europe would soon terminate, the Department of National Defence announced an "intended education program for interested personnel" (Classrooms Crowded at S17, 1946, p. 23). This educational scheme was conducted in two different fashions; the first being the First Canadian Rehabilitation Trade School located overseas and the second being local training conducted at army bases across Canada.

TRADES TRAINING OVERSEAS

By January 1946, prior to the massive demobilization of military personnel and their return to Canada, there were 13 courses in trades training being taught by the 1st Canadian Rehabilitation Trades School operated by the Canadian Army. The length of the majority of courses was six weeks, although some courses were of four weeks or 12 weeks duration. The schools were organized along "civilian lines with a view to providing the military students with a good practical working knowledge of the trade in which they took instruction" (Trades Training Overseas, 1946, p. 43).

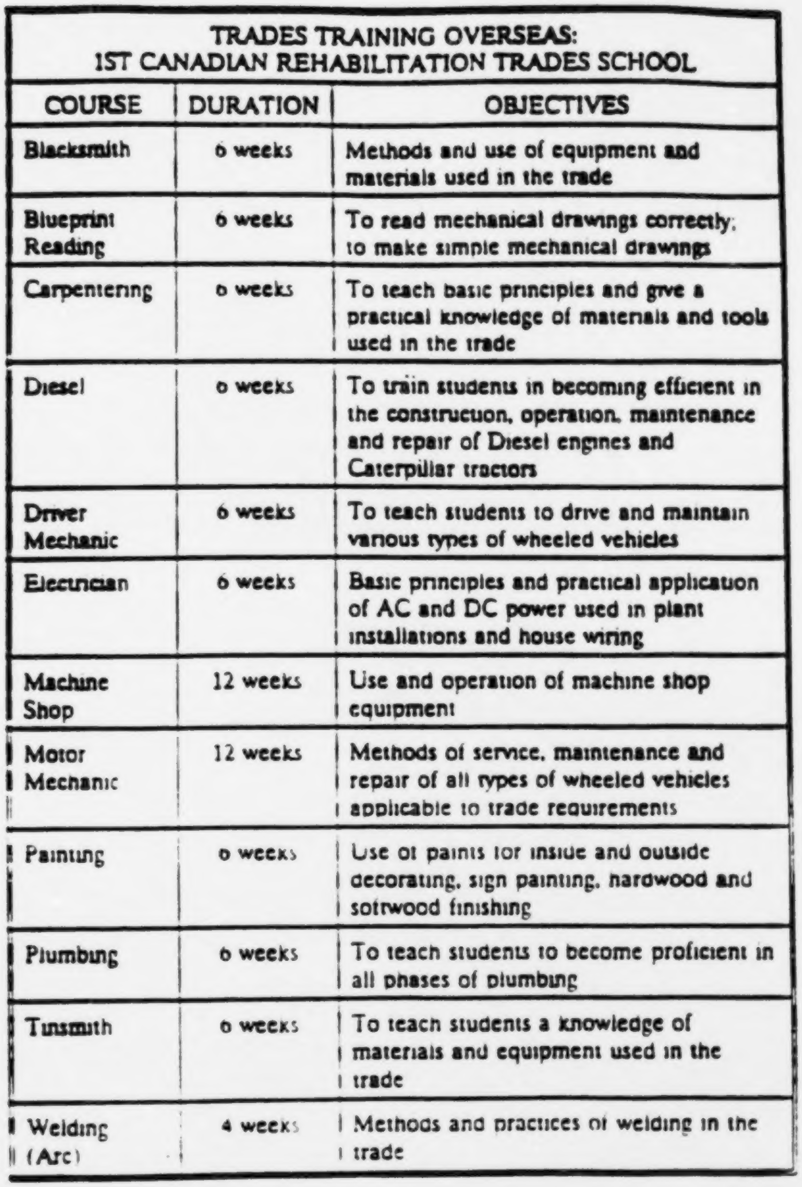
The grading system was designed to permit a ready comparison with civilian trade standards and was described as such:

> Grade A. A good practical working knowledge of the trade which would enable the man to do first class work in his trade.
>
> Grade B. A practical knowledge of his trade but requires further training and experience (p. 43).

The courses created represent realistic trade training for the time period and are presented in Table 4, page 105. These courses ranged from blacksmithing to welding and demonstrated possible vocational training which would be practical and useful in the return to civilian life. Of the 13 retraining courses offered, blacksmithing, blueprint reading, tinsmithing, and driver mechanic were not recognized as qualified trades in the Province of Alberta in 1945 either under the Tradesmen Qualification Act 1936 or the Apprenticeship Act 1944 (Rainsforth, 1991, p. 129). The valid point regarding the other courses that were recognized as qualified trades was that the Canadian army in its retraining of personnel offered viable and practical courses which could assist ex-servicemen when they returned to civilian life and employment.

Table 4

Trades Training Overseas (1945)



TRADES TRAINING OVERSEAS: 1ST CANADIAN REHABILITATION TRADES SCHOOL		
COURSE	DURATION	OBJECTIVES
Blacksmith	6 weeks	Methods and use of equipment and materials used in the trade
Blueprint Reading	6 weeks	To read mechanical drawings correctly; to make simple mechanical drawings
Carpentering	6 weeks	To teach basic principles and give a practical knowledge of materials and tools used in the trade
Diesel	6 weeks	To train students in becoming efficient in the construction, operation, maintenance and repair of Diesel engines and Caterpillar tractors
Driver Mechanic	6 weeks	To teach students to drive and maintain various types of wheeled vehicles
Electrician	6 weeks	Basic principles and practical application of AC and DC power used in plant installations and house wiring
Machine Shop	12 weeks	Use and operation of machine shop equipment
Motor Mechanic	12 weeks	Methods of service, maintenance and repair of all types of wheeled vehicles applicable to trade requirements
Painting	6 weeks	Use of paints for inside and outside decorating, sign painting, hardwood and softwood finishing
Plumbing	6 weeks	To teach students to become proficient in all phases of plumbing
Tinsmith	6 weeks	To teach students a knowledge of materials and equipment used in the trade
Welding (Arc)	4 weeks	Methods and practices of welding in the trade

Trades Training Overseas. (1946). **Canadian Army Training Memorandum** No. 59, p. 43.

EDUCATIONAL TRAINING IN CANADA

The Canadian military learned a valuable lesson during the lean years of equipment procurement that was available to the Canadian military in the 20 years between the world wars. The 1920's served as a good example of lost years from the standpoint of equipment. Only basic items were procured; helmets, webbing, rifles, gun and small arms ammunition and four Canadian-made six-wheeled trucks. The situation in the 1930's was even more dismal with the army limited "to maintaining what it had and procuring only a few more trucks and tracked vehicles. It was possible only to provide for the training of a minimum cadre" (Harris, p. 201). It was a time when the technology of mobility and the training of personnel required to maintain this mechanical and electronic technology was not receiving its due consideration by politicians or by senior members of the military. Even when it became obvious that "tanks, armored cars, and mechanized transport would have firm places in the new order of battle, Canada's field artillery still maintained horse-drawn guns that were outranged by more modern, mechanized pieces by as much as four thousand yards" (Harris, p. 202). With the influx of civilian volunteers during the Second World War to operate and to maintain the massive mobile military, the Canadian military increased its commitment to educating its personnel in the vocational and technical aspects of its infrastructure. A great deal of the training was conducted by military personnel who had learned the skills required to maintain the military system during their civilian employment before enlistment. The military was quick to utilize these skilled civilians to maintain their infrastructure by providing them with rank promotions. One of the requirements of rank promotion was to instruct other ranks in similar trades. The military used this procedure effectively during the Second World War by implementing additional training under the control of the Directorate of Military Training which was under the authority of the Chief of the General Staff. This additional training was conducted at local levels by Unit Education Officers with actual training being conducted by non-commissioned officers (NCO) using whatever military facilities were available; however, there was no firm schedule for the creation of additional vocational training. At the Longue Pointe Ordnance Depot in the Province of Quebec, the Education Training Program was implemented in the fall of 1943 (Classes at Longue Pointe, 1946, p. 18). Other programs commenced elsewhere in the latter days of 1945 while soldiers waited for demobilization and received "permission to fill their time with vocational training in order to prepare themselves for a return to civilian employment" (Khaki Collegiate, 1945, p. 28). Other vocational training was conducted as required by the military in order to maintain its daily operations. One example of this was the Canadian Postal Corps.

CANADIAN POSTAL CORPS

When the Canadian Postal Corps was activated for service in 1939 the majority of its personnel was drawn from the civil Postal Service. Within a short period of time, it became increasingly difficult to obtain sufficient numbers of experienced men to fill the expanding requirements caused by the massive increase in the size of the Canadian Armed Forces and their deployment which was spread over the globe. As a result it became necessary to recruit personnel who had no previous vocational training in this area and then train them in both "civil and military postal procedure" (Postal Corps Training, 1945, p. 11).

Regular courses of instruction were inaugurated at the Base Post Office where personnel were given lectures on postal history, basic postal practices, financial procedures, and other aspects of postal work. In addition, the postal trainees were also given practical instruction in the proper handling of the various classes of mail by qualified officers and NCO's. It is interesting to note, according to the next source article written in 1946, that many "of the military personnel involved in the Canadian Postal Corps had announced their intention of entering the civil Postal Service after their discharge from the Armed Forces" (p. 11).

CANADIAN ARMY EDUCATION

As mentioned previously, there was no formal schedule of vocational training as imposed by National Defence Headquarters. The decision to implement vocational training was left up to the demands of personnel within each military district under the direction of a Unit Education Officer who in turn reported to a District Educational Officer. At this point in the research, it would be valid to examine several examples of different types of vocational training that took place across Canada. The underlying force behind these hastily designed programs was the military personnel soon to be discharged back into civilian employment. One interesting common factor with regards to these vocational programs was that all ranks were mixed within the instruction program, and the instructors of many of these programs were not officers, but skilled tradesmen temporarily wearing uniforms.

The methods that now could be used for providing military personnel with vocational training were twofold in direction. The first direction that appealed to many military personnel without the previous benefit of completion of a secondary education was to receive a general upgrading of basic subjects that would enable them to advance to vocational training. The second direction, which was of interest to personnel, was to take additional training in a vocation in which they had previous military experience or to change vocations.

The methods by which these rehabilitation programs were implemented at various military locations showed the autonomy or the resources possessed by Unit Education Officers. Many units depended heavily upon the Canadian Legion Educational Services which provided textbooklets on a variety of academic or vocational subjects, or in many cases, provided apparatus required for classroom instruction. One example of this was the typewriting class from the 4th Infantry Training Battalion, located at Chatham, Ontario. This class was organized in September, 1945 in answer to a demand by personnel for vocational training of a practical nature. A total enrollment of "eighty three with an average daily attendance of twenty increased the demand for instructional typewriters. The Canadian Legion Educational Services presented an additional fifteen typewriters to accommodate this vocational program" (Typewriting Class, 1945, p. 34).

A more formalized training program was implemented at the Canadian Infantry Training Center in Calgary, Alberta, by the conclusion of the Second World War. The objectives of this program was to "attempt to prepare the soldier for civilian life and seek to develop his native aptitudes into the skills necessary for his making a living as a civilian" (How Its Done at A16, 1946, p. 24). The objective of this program was reinforced by the application of two procedures by which every soldier contacted would gain considerable value from the program even though "that person might be posted out of the Calgary centre before completing his course of training" (p. 24).

The first procedure was that of the screening interview with the purpose that "A man who had no job to which he might return, or who signified that he wished to change his job, was classified along with those who definitely stated that they wanted specific training" (p. 24). The soldier was then interviewed by the Army Examiner on the basis of native aptitudes, background, and previous experience. The responsibility of the Army Examiner was to then estimate the soldier's relative chances of success in various types of work. Any soldier with no idea of what he wanted to do in terms of future employment was advised as to where his general aptitude was in order that he might, if he wished, prepare for work along that particular line after being discharged. All of the men interviewed were then referred to the Army Education Officer who assumed the responsibility of planning a course of training for the individual man by "making use of all available material on University, Canadian Vocational Training Courses, and those courses offered within the training centre" (p. 24). Academic prerequisites to technical courses were pointed out and information regarding the institutions where these courses were available was provided.

The second procedure examined by the education staff at the Calgary centre was that of instructional technique. In order to insure that each soldier coming for shop instruction would receive the maximum benefit from even a short period of training, all instructors arranged each course so that each lesson was a complete unit of instruction. The principle involved was that of providing enough theory to permit practical work to be completed. In the case of commercial courses, such as typing and bookkeeping, enough basic instruction was provided to enable the trainee to decide for himself whether he was suited for this type of work or not. In the case of academic upgrading, the instructors used the principle that:

> after a number of years of Army life, a man's school record might mean little because of his gaining knowledge and new skills on one hand, and his becoming "rusty" in certain knowledge and skills he had acquired in pre-war days (p. 25).

Before registering for a course, it was considered important the soldier's actual prerequisite knowledge of that course be ascertained. To monitor this, the instructors devised several graded tests, remodeling them when necessary until a test was developed which gave "sufficient information for a fairly accurate placing of trainees in each subject. After the placement tests were completed, each trainee was advised regarding necessary refresher courses before commencing more advanced studies" (p. 25).

THE KHAKI COLLEGIATE

The underlying idea behind the Khaki Collegiate was that of the first direction; to provide basic upgrading of secondary subjects. One example of this from Military District 10 located in the Province of Manitoba was a school founded in November, 1945. The facility obtained for this school was a former School for the Deaf at Tuxedo, Manitoba, complete with large classrooms and an auditorium which accommodated 250 soldiers of all ranks. The method of teaching was based on the "Dalton" plan in which each student worked at his own speed under the supervision of an instructor who could assist him in any difficulties.

The educational supervisors, "all officers, had experience as instructors and had been civilian teachers before joining the military services" (Khaki Collegiate, p. 29). The spacious classrooms were supplemented with a new library, and a science laboratory, completely fitted out by the Canadian Legion. The Canadian Legion was also responsible for providing materials for the courses offered. This was part of a program called "the Canadian Legion Educational Courses which was accepted as an entry level courses for university if completed" (p. 29).

By January, 1946, other "Khaki Schools" had been established in various locations at military bases in Canada. One of the largest ones was located at Camp Niagara in the Province of Ontario housed in an old Military Hospital and accommodating 720 soldiers. Courses ranged from Grade School through Middle and Upper School to Senior Matriculation and covered all of the prescribed subjects: "English, French, Mathematics, Social Studies, Latin, Spanish, Biology, Chemistry, and Physics" (Khaki School at Camp Niagara, 1946, p. 20). In addition, there was a "Commercial Department which offered courses in Bookkeeping, Shorthand, and Typing with limited vocational training provided in Art, Drafting, Radio and Electricity" (p. 20).

One of the major problems encountered at Camp Niagara was the lack of qualified instructors. Five officers and two junior NCO's were obtained locally but had to be supplemented "by three civilian teachers procured from a neighbouring town" (p. 21). In addition to obtaining the services of civilians to instruct the soldiers, the Canadian military also maintained comparative qualifications with civilian education procedures by purchasing the "latest editions of textbooks and reference books to be studied and referred to in connection with each of the subjects on the provincial curriculum. These were also used in conjunction with the Canadian Legion Educational Services which provided textbooklets on various subjects" (p. 21).

A similar program was established at S17 Canadian School of Infantry at Vernon, British Columbia. In this program, 263 soldiers enrolled for Canadian Legion Educational Services courses. This Khaki School operated two mornings a week with the following courses being offered: "Introductory Mathematics, Mathematics "A", "B", "C", Senior Matriculation Mathematics, English, Social Studies, French, Science, Practical Electricity, Principles of Radio, Bookkeeping "A", "B", Auto and Diesel Engineering" (Classrooms Crowded at S17, p. 25).

The demand for additional courses by military personnel taxed the ability of this particular Khaki School with similar problems encountered by other Khaki Schools, that of obtaining qualified instructors and/or facilities to teach additional courses. To alleviate this problem, night classes were also organized with the Vernon High School, using Vernon

High School teachers to provide instruction in "typing, metal working, woodworking, and drafting" (p. 25).

VOCATIONAL TRAINING

In addition to the academic upgrading which many soon to be demobilized military personnel requested and received at various military bases in Canada, a large number of personnel requested, and also received, skilled vocational training in sundry areas. In line with the policy which established Educational Programs throughout the Canadian Army, it had been found that "effective instruction was available for personnel wherever ordinary facilities were in existence" (They're Learning To Be Butchers, 1945, p. 32).

One such facility was utilized in Camp Borden, Ontario, where the Mess Officer, Lieutenant Termarsh arranged a six week course in butchering for interested personnel. The instructors, for this course, were butchers who had taken care of all the ordinary butchering needs for Camp Borden. In the Unit butcher shop, the classes were composed of 12 other ranks who learned the manner and method of "cutting, identifying various cuts of meat, and the proper preparation of meat products. As a follow-up to this instruction, the trainees were then detailed to a local abattoir where they were given further instruction in killing, skinning, and cleaning of meat" (p. 32).

LONGUE POINTE ORDNANCE DEPOT TRAINING

One of the earliest training programs began in 1943 at the Longue Pointe Ordnance Depot in the Province of Quebec. It is interesting to note that the Officer Commanding at the Depot was supportive of personnel being engaged in vocational upgrading by supplying all necessary supplies and equipment; however, all upgrading "was conducted in the evenings and on a voluntary basis" (Classes At Longue Pointe, p. 18). This was in contrast to other examples cited, as the military infrastructure still required the skilled services of personnel involved in the maintenance and repair of military equipment, while soldiers in Canadian Infantry Training Centers were not skilled technicians and were awaiting demobilization.

Due to the large number of technicians, military and civilian, employed at the Ordnance Depot, competent instructors had been secured with the result of a diversified program being offered to interested personnel. Emphasis was placed on making all trade courses practical; however, any essential mathematics required for any trade was taught during a part of that period. In addition, the results of any problems were "checked wherever possible by instruments or by practical application" (p. 18). One example of this teaching of practical application was the theoretical and practical part of Elementary Electricity which included house wiring in Lumex and BX cable. A model of a frame house was built "by the woodworking class using full size materials.

Two stories were built to make the use of three and four way switching more realistic. The blueprints were also produced at this school using proper symbols and all practical work done in strict adherence to the Canadian Electrical Code" (p. 19).

When the soldiers enrolled for these courses they were given apprenticeship time. Upon completion of the course they could then continue onto more advanced courses. The military believed in the value of this training, not because it was of value to military personnel soon to be demobilized, but rather because it provided technical upgrading to career personnel which assisted the military in maintaining its technical infrastructure. The viewpoint at the Longue Pointe Ordnance Depot reinforced this Education Training Program:

> The value of these courses has been proven by the fact that most of these men have gained as much or more knowledge and practical experience than they would have gained working as apprentices in civilian life. Those returning to civil life who have followed these courses for nearly two years are able to complete their apprenticeship in approximately two years. Those remaining in the army have greatly enhanced their chances of promotion and of passing trade tests (p. 20).

SUMMARY

The demands of two world wars upon the Canadian military organization in the twentieth century created the realization that military personnel must be trained in all technical aspects in order to maintain the military infrastructure. At the same time, it also became evident that the Canadian military would utilize skilled civilians during hostilities in order to complete tasks. This viewpoint of military dependance upon skilled civilians to complete military tasks was generalized through the examination of specialized Corps created during the First and Second World Wars and their subsequent disbandment once hostilities were completed. This generalization is also reinforced by the examination of the politically imposed down-sizing of military personnel and services immediately after cessation of hostilities. The Canadian military's dependance upon the small number of career soldiers and NCO's to provide a nucleus of skilled technicians with limited facilities has not been given enough credit in consideration of the maintenance of the infrastructure.

The twentieth century has been a transition century in terms of technology. Warfare became highly mobile with the advance of electrical and mechanical technology; all of which required skilled technicians to operate and maintain. Economic realities in Canada, between the two world wars, decreed that the military would not be modernized by obtaining the latest in mechanical technology. Political dependance after the Second World War among the western democracies against the expanding Communist political system did produce a vast innovative technical expansion, chiefly designed by the United States of America. The inclusion of the geographical area of Canada under the "protective umbrella" offered by the American military technology through alliances such as NATO and NORAD encouraged political decisions to maintain a small military force with limited technical expansion beyond that of maintaining the current military infrastructure.

The providing of retraining courses to disabled soldiers after the First World War was a political decision made with regards to the well-being of Canadian society. Failure to provide retraining would have been a moral insult by Canadian society to its veterans, not to mention increased financial responsibility to provide additional support for disabled veterans and their families. It is the opinion of this researcher that the Khaki University of the First World War was more of a healthy diversion for soldiers interested in remembering the positive aspects of a civilization that was destroying itself in the mud of France and Flanders than in occupational training for use as civilians.

The willingness of the military to provide occupational training for personnel after the Second World War is a reflection of an awareness by the Canadian military and the personnel involved in the value of upgrading academic or vocational skills. While many of the courses offered were the result of military personnel requesting practical courses, many of the technical courses were designed to assist career soldiers in upgrading their skills in order for them to achieve rank promotion and still provide the military structure with a nucleus of skilled personnel.

CHAPTER V

CURRENT TECHNICAL AND VOCATIONAL TRAINING

INTRODUCTION

The research focus will concentrate in this chapter on the current ability of the Canadian Forces to provide the required maintenance and operation of its infrastructure in terms of technical and vocational training. This chapter will be divided into three sections; the first examines the socio-demographics of Canadian society which provides recruits to the Canadian Forces; the second examines the methods employed by the Canadian Forces to attract recruits; and the third examines selected trades occupations in the land element.

GENERAL OVERVIEW

The progression of new ideals, designed to improve the technical ability and comprehension in terms of maintenance of the Canadian military infrastructure is similar to the progression of technology itself:

> that of a maze rather than a straight and narrow road leading to known outcomes. Technical progress is just one aspect of a wider progress or development within a society and changes in the direction of technical progress occur whenever the values and objectives of society change (Pacey, 1989, p. 1).

In terms of military chronology as explained by Howard (1977), the Canadian military was created in 1867 at the conclusion of the "wars of the nations" and was a juvenile as the next age, "wars of the technologists", began with the twentieth century. Side by side with the administrative revolution of the bureaucracy that created the national military structures of Europe in the nineteenth century was also the technological revolution.

The Canadian Forces became cognizant of, and responded accordingly during the Second World War to, the immense increase in technical knowledge which affected the technical requirements for a large portion of personnel in order to maintain this military infrastructure. The support systems of the military also became "highly technical as the reliance on computers increases in such areas as personnel, supply, management, finance, motor transport et cetera" (Tierney & Pinch, 1980, p. 9). This increased reliance upon skilled technicians and other support services personnel is demonstrated in the numerical decrease of Combat Arms (Infantry, Artillery, Armoured and related trades) personnel to approximately "twenty percent of total personnel" (Tierney and Pinch, p. 9).

The technical characteristics of Canadian society and economics in the post war years have required the Canadian military to be at the foremost in obtaining or training of skilled technicians in order to maintain the military structure. Defence imperatives have dictated that the military be involved with technological change and innovation. This technological pace, according to Tievendell and Gaudet (1985), has become so rapid since the Second World War that "warfare is so revolutionized as to make prediction to the year 2000 almost impossible" (p. 40). If it is also considered, that Canada is facing a shortage of skilled manpower in this advancing technology, then it is easy to perceive the difficulties experienced by the military to obtain quality recruits. These requirements for recruits with higher levels of education and the changing socio-demographics of Canadian society, has produced major changes in the methods used by the Canadian Forces to obtain and to retain skilled personnel.

POST WAR EDUCATIONAL SOCIO-DEMOGRAPHICS

The Canadian military has always depended upon its "host society" (Cotton, 1980, p. 33) in order to produce a stable flow of recruits. This has been achieved, with only two exceptions during the two world wars, through the concept of an all volunteer military force. Since this structure is dependent upon voluntary participation, the development of career policies is a particularly critical one. According to Pinch and Cotton (1978) not only "must they be consonant with a rather unique set of operational demands, they must also be compatible with accepted societal norms and with the changing character of society at large" (p. 1). The recruitment of an all volunteer force in the post war years is vulnerable to "shifts in societal age distributions, unemployment rates, educational participation rates and broad value changes" (Pinch and Cotton, p. 1).

The traditional approach of obtaining personnel for the Canadian military was to recruit unskilled males between the ages of 17 to 24 years. Unskilled males, from the military viewpoint, are defined as; "young men who are considered untrained upon entry into the military and receive training in a trade after enrollment" (Cotton, 1974, p. 1). This traditional approach was compatible with military thinking and requirements for three decades after the Second World War. In consideration that 85 percent of recruited personnel (Cotton, 1974, p. 1) were of the unskilled category, the recruitment policy of the military was not to "appraise individual background, training, and civilian occupational experience with a view to matching the skill requirements of specific occupations in the Canadian Forces" (Pinch and Cotton, p. 4). Individuals, upon application, were:

> treated as "equal" upon application, regardless of type of civilian work experience, education, or technical qualifications. They are allocated to trades on the basis of aptitude measurements, themselves devised within the Forces. For example, the recruit who meets the minimum standards, but dropped out of school at grade eight, is treated almost identically to the person who completed one year of university, has four years experience in the labour market, but, fails to meet minimum test standards for entry as an officer (Pinch and Cotton, p. 4).

The socio-demographics of Canadian society reinforced the military procedures to maintain the largest vocational training establishment in Canada (Pinch and Cotton, p. 4). The traditional assumptions about this unskilled market as presented by Cotton (1974) provided the military with no reason to change recruitment policies or vocational skill requirements. These assumptions were:

> a. that there is an abundant supply of potential recruits available in Canadian society...
>
> b. that the great majority of potential recruits are high school dropouts with a grade 8, 9, or 10 education
>
> c. that a military career represents a secure and somewhat unique employment opportunity for such individuals who would otherwise have few chances for stable employment in the labour market
>
> d. that potential recruits with such educational levels are adequately equipped, both socially and intellectually, for the demands of training and employment in the Canadian Forces, IE: that the person with a grade 10 education or less is generally good Forces material (pp. 13-14).

It can be debated, that the Canadian military was providing a positive service to Canadian society by absorbing, annually, a large number of males without junior matriculation or any technical or other occupational skills. It is clear that the recruiting procedures worked well for the military in a society where the military age of males could also be distributed as follows:

> a. 20 percent with Grade 12 or more (i.e., at least a complete secondary education)
>
> b. 5 percent with qualifications in specific occupational trades particularly technical areas
>
> c. 75 percent with less than a complete secondary education and without special training (Pinch and Cotton, 1978, p. 5).

In the decade after the Second World War, the training schools, developed by the Canadian Forces to meet the knowledge needs of rapidly changing technologies, offered perhaps the major opportunity for Canadian youth to acquire specialized training in technical trades. According to Pinch and Cotton (1978), in the early "Fifties" school leavers with grade 10 or less outnumbered those with grades 11 and 12 by a margin of more than three to one (p. 5). The nature of this demand for recruits remained congruous up to the 1970's. The military continued to seek what it termed "unskilled" recruits in order to process its newly acquired personnel through "in-house training programs" (Cotton, 1980, p. 34).

In the 1970's, it became apparent that the supply of applicants to meet the demand for recruitment quotas was decreasing in increasing numbers. Fundamental changes had occurred in the size and nature of the traditional market for unskilled manpower. According to Cotton (1974) the perception of "major socio-demographic shifts in the potential recruit population had been reinforced by indicators of change in the behavior, values, and career expectations of younger servicemen" (p. 2).

Part of this major socio-demographic shift was in the educational achievements of Canadian society from the 1960's onwards. Despite an apparent sound demographic base for military recruitment, the military:

> failed to develop strategies which would make it an attractive first employment option for technically trained and occupationally experienced youth with 11 or

> more years of schooling, a group which constituted over 50 percent of the potential market by the mid 1970's (Cotton, 1980, p. 35).

In addition to this potential market, which was remaining in educational facilities for a longer period of time, must be added the "shrinkage of the potential pool in the 1980's as the youth of the baby boom passed into middle age" (Cotton, 1980, p. 35). The critical trends, however, were in the education levels of potential recruits.

CRITICAL TRENDS AND IMPLICATIONS

The ability of the Canadian military to operate effectively in hostile environments and to maintain this effectiveness in other politically required environments demands a closed personnel management system. This system would require, as defined by Tierney and Pinch (1980):

> the introduction of new personnel at the bottom of its organization, with few opportunities for direct civilian lateral skill entry, and pro-gression through a series of skill levels with rotations of job and function....As technical skill and administrative competency develop, higher levels of rank and pay are awarded to incumbents. This system requires... a continuous flow of new recruits....For non officer personnel...the armed services have traditionally recruited unskilled and inexperienced males between 17 and 24 years of age, a majority of whom are between 17 and 20. In Canada, this amounts to 85 percent of the annual intake (p. 3).

This inability to achieve the recruitment of required unskilled and inexperienced personnel was detected by military recruiters in the 1970's. This change in the manpower pool was brought about by the radical changes or opportunities offered by the educational system. The two critical trends, which affected military recruitment, were a direct result of the changing values of Canadian society and were thus:

> 1. greatly increased student retention in the secondary school system in all Canadian provinces; such that school leavers are older, and have more formal education than was previously the case. This change has been accentuated in the period 1966 to 1973.
>
> 2. greatly increased opportunities and consequent higher participation rates at the post-secondary levels in all provinces....Within this category, non-university vocational technical training has been especially noticeable in the past decade, as a network of so-called "community colleges" has mushroomed across the nation (Tierney and Pinch, p. 2).

Each of these trends has influenced the availability of "unskilled" non-officer recruits; the first by providing an improved educated pool of potential manpower and the second by the removal of a large number from the first pool into highly publicized and publicly funded post secondary institutions. In 1951, "approximately 25 percent of the beginning students made it to grade 11. By 1961, the retention rate was closer to 50 percent; by 1971, it was approaching 75 percent" (Pinch and Cotton, p. 7).

It is then from this remaining base population of high school graduates that the post-secondary institutions (community colleges, universities, vocational training schools, et cetera) the public and private employee training sectors and the "military training centres would recruit their new entrants" (Tierney and Pinch, p. 6). An example of this is the rapid expansion of apprenticeship training in the

Province of Alberta during the 1970's. Rainsforth (1991) establishes that:

> between 1971 and 1975, the number of apprentices increased to 13,303 from 8,716, an increase of 66 percent....Of the 13,303 apprentices registered, 10,745 were attending school in a block of formal training from six to eight weeks, depending on the trade (p. 179).

Since the military had no recruiting strategies for tapping this potential manpower pool, this pool was in effect lost as potential recruits. The "bottom line" result, as stated by Cotton (1980), has been that personnel development policies and military training "no longer articulate with the educational system in Canada, but rather compete with it" (p. 36). This trend continued to plague the Canadian military in the 1980's as applications decreased "thirteen percent from 1987 to 1988 and nineteen percent less than the average over a five year span from 1982 to 1987" (Department of National Defence, 1988, p. 97).

In addition to application decreases of potential recruits, there were also problems encountered with the attrition rate of skilled technicians. The focus of the military to place recruiting efforts on the younger less-educated person with a history of marginal involvement in the labour force has been costly to the Canadian Forces in terms of high rates of attrition. The Canadian Forces "had to enroll approximately 30 percent more recruits" (Tierney and Pinch, p. 11) in order to have sufficient operational replacements at the completion of the initial trades training phase of employment. The greatest losses to the Canadian Forces, according to Tierney and Pinch (1980);

> have occurred among the younger, least educated male enrollees....25 percent of the lower educated left in the first six months of service. By the time they could begin productive work (18 months of service) 43 percent had already been lost. Those who entered the Forces with a grade 11 or more tended to leave the CF at a 10 percent lower rate (p. 12).

There are sociological implications to educational level increases in a society, which are not within the scope of this research. Some of these would include: "population growth and change, family patterns, technological change and competitive pressures, employment trends, education trends, youth values and attitudes et cetera" (Hamel, 1987, p. 5). The Canadian military, by the mid 1970's, was aware that traditional recruiting policies based on the assumption that unskilled recruits made the best soldiers were outdated in light of a society that placed emphasis on completion of a secondary school program. In addition, recruit applicants, while still unskilled, were better educated and "to likely have other opportunities available" (Cotton, 1974, p. 35) plus the "mere fact of enrollment was no guarantee of career retention if expectations are unmet" (p. 35).

The immediate task of the Canadian military in the latter half of the 1970's was to attract potential recruits away from the competitive civilian employment sector and retain them as career soldiers. One of the first steps implemented was to change recruitment policies in order to obtain recruits capable of learning technical skills, or to recruit personnel who already possessed technical skills obtained from civilian institutions and had expressed interest in a military career. One of the misconceptions perceived by the civilian sector of Canadian society in regards to the Canadian Forces structure is the lack of awareness regarding the wide scope of technical and vocational occupations available to career soldiers.

CANADIAN FORCES MILITARY TRADES CLUSTERS

All of the Canadian Forces military trades have been clustered into codes which demonstrate the technical nature of a military infrastructure. While several of these clusters are unique in providing technical training for a particular element of the Canadian Forces, other trade clusters are integrated in terms of providing technical or vocational services to the combined elements of the Canadian Forces as required. These clusters have been described by Yee (1977) as:

01. Zero series cluster from 011 to 099 dealing with the Combat Trades.

02. One hundred series cluster from 111 to 199 listing the Combat Support Trades.

03. Two hundred series cluster from 211 to 299 emphasizing the Communications and Radar Trades.

04. Three hundred series cluster from 311 to 399 concentrating on the Marine Engineering Trades.

05. Four hundred series cluster from 411 to 499 listing the Land Vehicle and Weapons Support Trades.

06. Five hundred series cluster from 511 to 599 dealing with the Aviation Support and Shop Trades.

07. Six hundred series cluster from 611 to 699 concentrating on the Construction Engineering Trades.

08. Seven hundred series cluster from 711 to 799 emphasizing the Medical and Dental Trades.

09. Eight hundred series cluster from 811 to 899 dealing with Personnel and Administration Support Trades.

10. Nine hundred series cluster from 911 to 999 listing the Supply and Transportation Trades (Yee, 1977, p. 45).

Descriptions of technical training in selected trade occupations will be expanded further in this chapter while specification sheets for selected military trade occupations from various clusters are found in Appendix D.

THE CANADIAN FORCES CAREER INFORMATION SYSTEM (CFCIS)

The heavy emphasis on non-Combat Arms personnel in order to maintain the highly developed technical support role required the Canadian Forces to adapt its procedures utilized for recruit selection. Horton (1980) summarized the reason for the current selection procedures in use as follows:

> Also, with rapidly changing technology in the Armed Forces, comes the necessity to recruit an increased proportion of high quality people who have completed high school or beyond, or who are already skilled tradesmen (p. 4).

This was demonstrated in recruiting trends experienced by the Canadian Forces during the period from 1975 to 1983 where the proportion of enrollees "with elementary education (grade 8 or less) dropped from 7 percent to 1.9 percent" (Tivendell and Gaudet, 1985, p. 4). At the same time, the proportion of enrollees with secondary education was "80 percent and 10.3 percent with some post-secondary education" (p. 32). Regardless of the higher percentages of enrollees with secondary education, the attrition rate of approximately 40 percent provided evidence that recruit expectations regarding the military as a career and the career occupation training were not effective.

By 1974, the attrition rate in the Canadian Forces had increased. Research conducted in that decade highlighted the requirement "for a systematic approach to vocational counselling in the recruiting system" (Pelletier, 1984, p. 1). This research became implemented as the Canadian Forces Career Information System (CFCIS). The CFCIS was designed to provide accurate vocational and lifestyle data about the employment available in the Canadian Forces. As summarized by Pelletier (1984), the CFCIS was to assist the applicant:

> to understand the basis for the selection and trade assignment decision reached on his/her behalf. In other words...more effort will be expended to explain to the applicant, the impact of such things as test scores, education level, personal and/or medical limitations, as well as to accurately describe the available trade options (p. 1).

The CFCIS has four components which are presented to the applicant in order; the Orientation Video, Automated Counselling/Data Processing Facility, Trade and Lifestyle Videos, and, Printed Trade Briefs. The Canadian military is obviously content with the CFCIS format which is designed to offer a realistic account of the military occupations available. The CFCIS has been described by Pelletier (1984) as:

> a modern multi-model method of providing and managing vocational counselling information and personal data. It was based on scientifically confirmed counselling principles derived from the most up to date vocational counselling theories available and uses state of the art audiovisual and data processing technology (p. 3).

THE ORIENTATION VIDEO (OV)

The Orientation Video is a 24 minute dramatic production filmed in actual recruiting, training, and employment locations. This video describes the philosophy of the Canadian Forces and both basic and trade training. In addition, it is designed to be "thought-provoking and to stress the need for a positive attitude toward the military" (Pelletier, p. 3). It is shown to all applicants at the recruiting centres prior to the processing which includes a medical examination, a classification test battery, and several interviews.

THE AUTOMATED COUNSELLING/DATA PROCESSING FACILITY (ACDPF)

The ACDPF is based on the use of an interactive computer terminal which assists the user in making an "acceptable job/person match while encouraging self knowledge and vocational maturity" (Pelletier, p. 3). This is accomplished by the applicant's completion of a questionnaire designed to specify the applicant's job, environment and interest preferences as well as personal needs, goals and characteristics. The applicant can then "interact with the computer into which the recruitment staff have input the applicant's medical examination results, classification test battery results and personal data including, name, age, education level et cetera" (p. 3). The interesting aspect of this "discussion" with the computer is that:

> the list of initial trades for which the applicant qualifies can change depending on the applicant's responses. The applicant can change responses and restore trades removed from the list because of a certain response. In this manner, the applicant learns how personal preferences and needs can affect the list of acceptable trades. When a short list of acceptable trades is reached, the applicant can compare these trades or certain aspects of them; such as training time, employment areas, prospects for promotion, et cetera (p. 3).

The positive aspect of the ADCPF from the military's point of view is the hard copy received by each applicant. Based on input provided by the applicant, the computer will select several trade occupations which may or may not satisfy the initial occupational interest of the applicant.

TRADE AND LIFESTYLE VIDEOTAPES (TLVs)

Each of the Canadian Forces trades available to recruits is described in a brief video of five minutes duration. These TLVs were constructed from interviews with senior members of that particular trade using their own words to describe their trade and lifestyle and various personal experiences. In addition, representative footage of training, employment or lifestyle is shown to reinforce the verbal message. The information conveyed would include:

> a brief description of the trade, trade training, tools and equipment used, absence from home, dangers, difficulties and physical arduous tasks of the trade, probable employment, employ-ment locations, and advancement possibilities (Pelletier, p. 4).

The purpose of the TLVs is to provide each recruit with a realistic introduction to each occupational trade in which he/she has expressed interest. The contents of the TLVs are not free of bias as the videos allow for the inclusion of positive and negative comments by the narrator in the description of the occupational trade. The viewpoint of the military is to allow the recruits to become observant of the realism of various occupations which they may choose upon entry.

PRINTED TRADE BRIEFS

In addition to viewing the TLVs for trades which are under consideration, a corresponding set of hard copy trade briefs is provided to the applicant. These briefs allow the applicant to review or compare occupational requirements and commitments. The Trade Briefs contain the same information as the TLVs. Appendix E provides excerpts from Trade Brief for Military Occupation Trade: Radar Plotter 271.

CANADIAN FORCES TRAINING SYSTEM (CFTS)

The CFTS provides designated individual training to meet Canadian Forces occupational requirements. In 1987, there were "nineteen schools on five CFTS bases and at two other schools on bases assigned to other commands" (Department of National Defence, p. 87). Within this role of providing individual training, the CFTS is responsible for the "planning, controlling, and conducting of all basic recruit and officer training, and complete training for eighteen officer and fifty three non-commissioned member military occupations that are common to more than one operational command" (p. 89).

The CFTS established a Common Core Training Approach in the early 1970's with the purpose of providing service personnel with total and continuous occupational training throughout the military career of that person. Yee (1977) reports:

> The main aim of the training system approach to military training, that military training does not end after any particular course is completed, or at a given time; rather training will extend through-out the service person's active service career (p. 48).

The viewpoint expressed by the Canadian military to their applicants is very similar with regards to continuous training. The booklet, **Careers in the Canadian Armed Forces for Non-commissioned Members**, which is supplied to applicants describes 96 occupations available to other rank personnel and places importance on continuous training as:

> To stay at peak efficiency, we constantly require young men and women to train in specialized skills, so they can operate and maintain the sophisticated and complex equipment and perform the many and varied tasks that make us the modern force we are today (p. 1).

An example of this continuous occupational training is the additional training courses which are available to Radar Technicians who demonstrate the required ability and ambition to their superiors on the job site. These advanced courses and specialty courses can be completed through formal courses or on the job training and would include: AETE PDP 11/34 mini computer and peripherals, AN/FYQ 502(V) Communications Control Sub System, Regional Operations Control Centre (ROCC) Maintenance, Airport Surveillance Radar ASR 8K Maintenance, Primrose Lake Evaluation Range Tracking Radar Maintenance, and Instructional Techniques courses (Canadian Armed Forces Specification Sheet, RIA 0231-87E). Continual training is also required to keep personnel competent in the usage of updated technology which may pre-date formal courses. One example of this is the installation of the AN/TPS-70 transportable and tactical radar which tested the efficiency of 12 Radar Squadron. As Captain Jeff Griffiths stated upon completion of the task, "The beauty of this job is that no one can tell us we're doing it wrong, because nobody's done it before" (Chatelain, 1992, p. 32). In this particular situation, the continual training and efficiency of the personnel "paid off" as the mobile radar became operational. The pride felt by involved personnel on completion of their task indicated the self confidence of being able to adapt to new learning situations instilled by continuous training. The comment by Warrant Officer Cote, "my baby is born"

(p. 32), demonstrated the extent of personal involvement in "knowing" updated technology in order to complete tasks.

ADAPTIVE PROGRAMMES

Prior to this "continuous occupational training" of military personnel through the CFTS, the successful applicant had various channels of entry into the diverse selection of occupations, providing of course, there were employment openings in any particular trade occupation. In the early 1980's, Park (1982) reported that "there has been a decreasing number of trades made available to applicants at the Recruiting Centres. At present, almost all vacancies are dedicated to the operational land and sea trades" (p. 15). From a corporate viewpoint, this recruiting for select trades and occupations was realistic based on actual manpower requirements. There very well may be a "structural bias" as reported by Cotton (1979) in allocating recruits into Combat Arms who fail to meet entry standards for the more technical trades (p. 24); however, the mean scores from applicant General Classification (GC) tests which measure the applicant's general learning ability indicate "enrollee quality has remained constant and means that the operational trades are receiving a better quality recruit" (Park, p. 16).

The Canadian Forces established several adaptive programmes designed to combat attrition rates in Combat Arms, to procure recruitment into military trades of persons who already possess specific technical skills, and to train recruits with technical ability in military occupations.

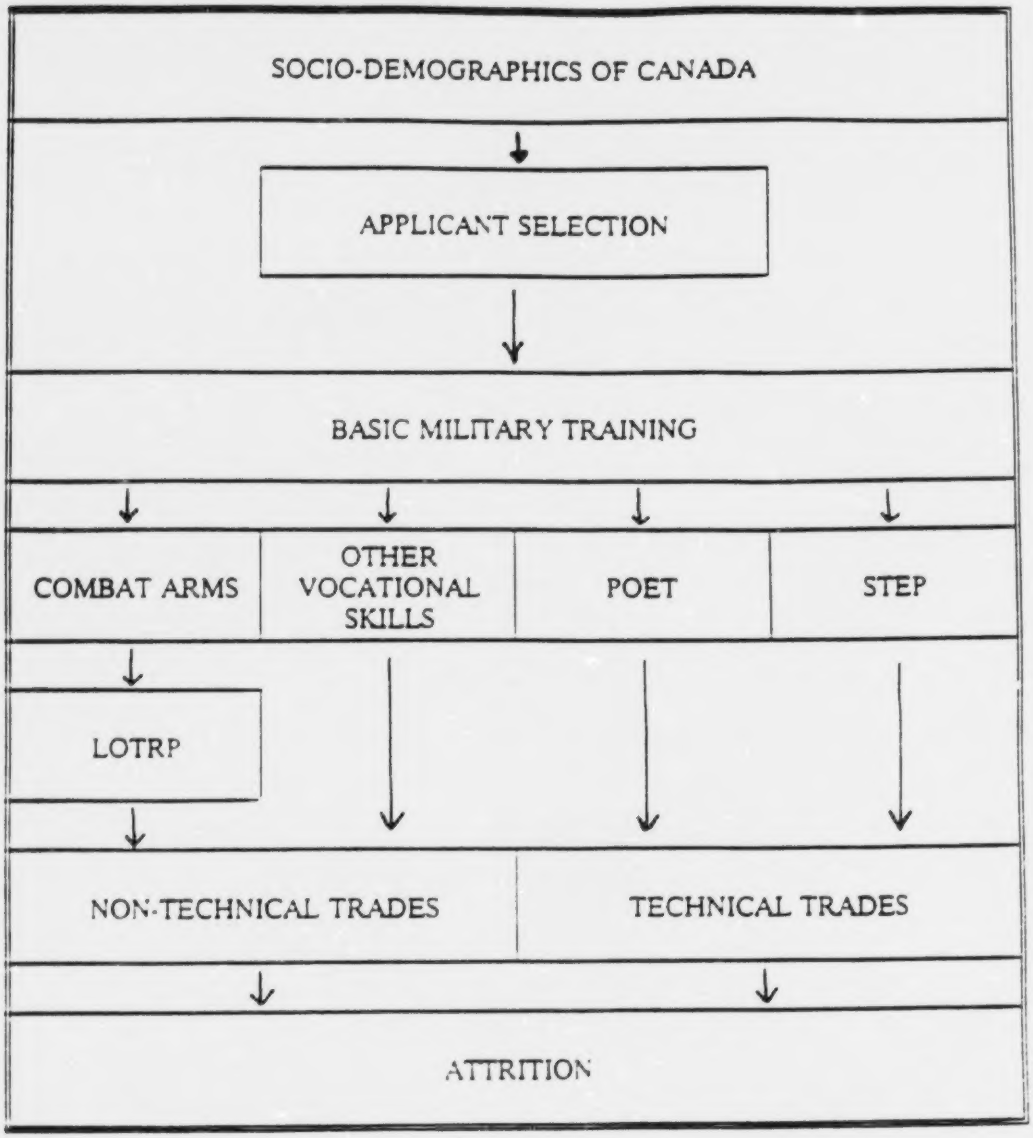
These programs are the Land Operations Trade Reassignment Programme, Skilled Trades Entry Plan, and Performance Oriented Electronics Training. Figure 1, page 140, provides a simplified diagram of career movement with relation to the adaptive programs available to recruits or other military personnel.

LAND OPERATIONS TRADE REASSIGNMENT PROGRAMME (LOTRP)

LOTRP was introduced in 1976 as a measure to decrease high attrition rates by personnel serving in Combat Arms. This programme is open to personnel currently employed in the Combat Arms and provides them with the opportunity, after serving a minimum of three years, to request reassignment to a technical trade or vocational occupation. The programme is voluntary for the individual and is provisional with regards to trades available. There are two advantages generated to the military infrastructure by LOTRP. The first advantage is to assist personnel in meeting self aspirations in "skill acquisitions and mobility tendencies" (Pinch and Cotton, 1978, p. 21). Prior to the introduction of LOTRP, many military personnel would leave the Canadian Forces and return to the civilian employment sector. This allowance, by LOTRP, provides Combat Arms personnel with the opportunity to remuster into other areas of occupational interest and assists the military by reducing attrition rates which are costly in terms of training and equipment. The second advantage, generated by LOTRP to the military, is the reduction of the attrition rate of personnel. While LOTRP

Figure 1

Canadian Forces Career Movement Through Adaptive Programs


SOCIO-DEMOGRAPHICS OF CANADA
APPLICANT SELECTION
BASIC MILITARY TRAINING
COMBAT ARMS
OTHER VOCATIONAL SKILLS
POET
STEP
LOTRP
NON-TECHNICAL TRADES
TECHNICAL TRADES
ATTRITION

does not reduce demands for unskilled recruits at the initial entry point, it does provide unskilled personnel to other selected trades and occupations who already possess a working knowledge and acceptance of military regulations and procedures. In effect, the selected occupation is receiving a "company man" at the CFTS location, one with full comprehension and acceptance of military procedures which recruits would not possess at the initial stage of employment.

LOTRP does not provide the military with sufficient numbers of personnel to maintain the technical or vocational requirements of the infrastructure. This programme was designed more to provide Combat Arms personnel with career alternatives rather than leaving the Canadian Forces for civilian employment. An adaptive programme which assists the military in obtaining skilled technicians is Skilled Trades Entry Plan.

SKILLED TRADES ENTRY PLAN (STEP)

With the increase in the socio-demographics dating from the 1970's of young adults remaining in secondary or progressing to post secondary institutions, particularly technical institutions, the Canadian Forces established a lateral entry program designed to recruit directly "into military trades of persons who already possess specific technical skills and competencies acquired through civilian technical training and/or employment experience (Pinch and Cotton, p. 21). In particular, STEP offers young men and women with an electronic background and who have graduated from a two or three year recognized technical institute, community college or CEGEP in the Province of Quebec, the opportunity to join the Canadian Forces and receive incentive pay and time credits for rank promotion. STEP recruits are employed in nine occupations; these are:

1. Radio Technician (221)
2. Terminal Equipment Technician ((222)
3. Teletype and Cipher Technician (223)
4. Radar Technician (231)
5. Electro-Mechanical Technician (431)
6. Integral Systems Technician (521)
7. Communications and Radar Systems Technician (524)
8. Instrument Electrical Technician (551)
9. Air Weapons System Technician (572)

(Canadian Forces, 1988, STEP pamphlet RIA 419-88B).

Several of these STEP occupations regarding scope of technical training will be explored further in the chapter. The advantage of the STEP program to the military is that of obtaining skilled recruits who have already received their technical training at their own expense and time. In addition, there is the advantage of obtaining recruits who are "highly adaptable to the demands of the trade" (Pinch and Cotton, 1976, p. 16); and possess "proven interest and aptitude for that type of employment...requires considerably less in-house training than his/her unskilled counterpart" (p. 16). Even with the stated advantages of obtaining civilian trained skilled technicians, the Canadian Forces were not able to fulfill all of their occupational requirements through the procuring of trained civilian applicants. An additional adaptive program was designed and implemented to teach technical skills to military personnel. This program was called Performance Oriented Electronics Training.

PERFORMANCE ORIENTED ELECTRONICS TRAINING (POET)

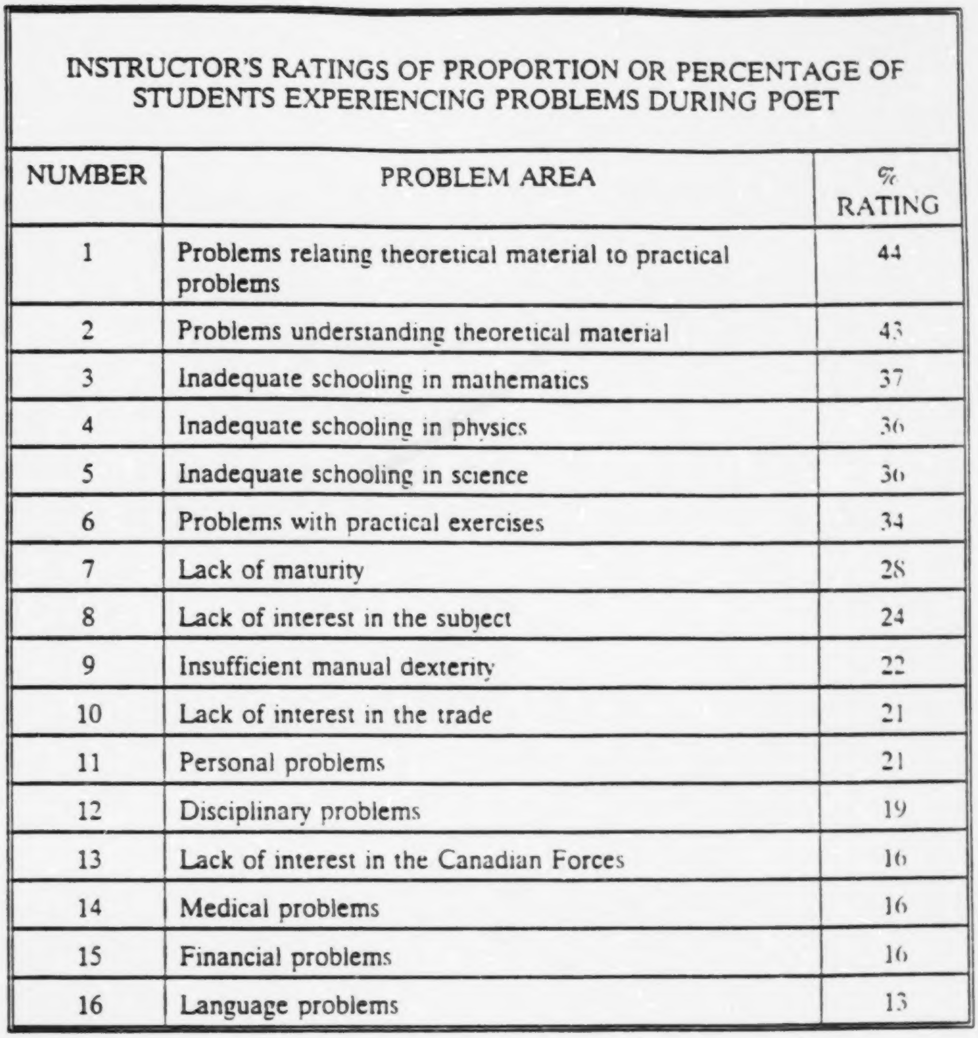
POET is the name of the basic entry training plan to which all individuals who express a desire to pursue a technical military occupation are assigned upon enrollment. Upon completion of basic training, all POET enrollees attend the Canadian Forces School of Communications and Electronics (CFSCE) at Kingston, Ontario, or at l'ecole technique des forces canadiennes (ETFC) in St. Jean, Quebec. There are nine military occupations which require the prerequisite POET training course. These nine courses are the same military occupations for which STEP enrollees receive incentive pay and time credits.

This basic electronics course is divided into three parts. Part 1 is taken by all of the POET enrollees and covers "mathematics, physics, direct current theory, alternating current theory, and solid state theory" (Angus, 1984, p. 2). The second part is composed of both theory and practice in such areas as "power supplies and amplifiers, oscillators and tubes, digital techniques, and synchro servos" (Angus, p. 2). Part 3 consists of "instruction and practice in AM and FM labs, and radar" (Angus, p. 2).

It is important to note, that, before accepting assignment to POET, the enrollee has no right to choose a specific military occupation from the POET field, and there is no way of knowing in advance which military occupation will be assigned personnel. The military occupation assignment usually occurs after the enrollees have completed Part 1 of POET. The extent of the enrollees' participation in Part 2 and Part 3 of POET is determined by the assigned military occupation, as enrollees will only take "those subjects relevant to their assigned military occupation" (Canadian Armed Forces, 1991, RIA 490-91B). The subject courses are designed to be as practical as possible with the least amount of required theory taught by instructors. Theory is "inserted only as it relates to the daily performance objectives of the students on their equipment" (McNeil, 1970, p. 15). In addition to the daily classes, the enrollees still have "a heavy academic workload" (Angus, p. 2) to complete through "personal instruction pamphlets" (McNeil, p. 15). Subject areas in which the students experienced difficulty, according to a questionnaire sent to all instructors in 1984 (Angus, 1984), indicated a high percentage of students had difficulty with "mathematics, physics and science subjects" (p. 4). Table 5, page 145, expands upon Instructors ratings of percentage of students experiencing problems during the POET course. Instructors believed that this situation followed from "a lack of adequate academic preparation for the POET course" (p. 4). However, since subject theory in many military occupations is taught informally on the "must know, should know, and could

Table 5

Instructors' Rating of POET Students (1984)



INSTRUCTOR'S RATINGS OF PROPORTION OR PERCENTAGE OF STUDENTS EXPERIENCING PROBLEMS DURING POET

NUMBER	PROBLEM AREA	% RATING
1	Problems relating theoretical material to practical problems	44
2	Problems understanding theoretical material	43
3	Inadequate schooling in mathematics	37
4	Inadequate schooling in physics	36
5	Inadequate schooling in science	36
6	Problems with practical exercises	34
7	Lack of maturity	28
8	Lack of interest in the subject	24
9	Insufficient manual dexterity	22
10	Lack of interest in the trade	21
11	Personal problems	21
12	Disciplinary problems	19
13	Lack of interest in the Canadian Forces	16
14	Medical problems	16
15	Financial problems	16
16	Language problems	13

Angus, R. J. (1984). **Basic Electronics Training in the Canadian Forces: Instructors' Impressions of Student Problem Areas** (Technical Note 19/84). p. 5.

know" concepts, the POET instructors participating in the Angus (1984) questionnaire "generally were not displeased with the present overall pass-rate of POET students" (p. 4).

SELECTED MILITARY OCCUPATIONS

One of the supporting objectives within the purpose of this research is to document the extensive requirements for occupational training as conducted by the Canadian Forces. This supporting objective will be examined through two parts: the first part will examine the technical training in five of the nine trades which are unique to both POET graduates and STEP personnel and provide occupational deployment in the Land or Air element of the Canadian Forces. The second part will examine various other military trade occupations which require technical or vocational skills.

The five military occupations which are unique to the Land or Air element of the Canadian Forces are: Radio Technician, Terminal Equipment Technician, Teletype and Cipher Technician, Radar Technician, and Electro-Mechanical Technician. The remaining occupations: Integral Systems Technician, Communication and Radar Systems Technician, Instrument Electrical Technician, and Air Weapons Systems Technician are unique in that assignment to these trades will be within the Air or Sea element of the Canadian Forces.

RADIO TECHNICIAN (221)

Radio Technicians are Communication System maintainers. They are responsible for the installation and maintenance of "all communications equipment used in the field or at permanent installations" (Canadian Armed Forces, 1987, RIA 0221-87E). A broader definition of the job description will require that Radio Technicians

> install, check and maintain computers, radios, modems and multiplexors used in the field or at permanent installations....maintain high and low power transmitters and receivers, data processing and public address systems and install and maintain communications equipment in control towers and mobile radio vehicles (Canadian Armed Forces, 1986, p. 17).

Upon assignment to this occupation through STEP enrollment or upon completion of the POET program, personnel will attend a 17 week course at the Canadian Forces School of Communications and Electronics at Kingston, Ontario. The basic occupation training will include:

- maintaining telecommunications systems (electronic, electro-mechanical, video, fiber-optic),
- maintaining antenna systems,
- operating power generating systems related to the occupation,
- operating hand and power tools,
- performing installation of, and modification to, assigned equipment

(Canadian Armed Forces, 1987, RIA 0221-87E).

Within the parameters of continuous vocational training, Radio Technicians will also undertake further training through formal courses or on the job training as they progress through their careers. Several examples of additional training would be: Mini Computer Data Gen Nova

1200, AETE PDP 11/34 Minicomputer and Peripherals, and Microwave Radio Systems (MICROTEL 878FL) (Canadian Armed Forces, 1987, RIA 0221-87E).

TERMINAL EQUIPMENT TECHNICIAN (222)

The role of the Terminal Equipment Technicians is to maintain intercommunications equipment. They are responsible for the installation and maintenance, modification and operational checks of intercommunications equipment. This would consist of

> telephone, data transmission, radio relay and interoffice equipment used in the field and on bases. The Terminal Equipment Technician must also operate and maintain test equipment and diesel/gasoline power generating systems used with terminal equipment (Canadian Armed Forces, 1986, p. 17).

Upon completion of the POET program, or through STEP enrollment, personnel would proceed to the Canadian Forces School of Communications and Electronics for 21 weeks of instruction and practical application. Occupational training would include

- maintaining land tactical communications switching equipment and systems, and strategic telephone and data communications equipment and systems
- maintaining interfacing devices (optic isolators and fiber optic transmission systems)
- maintaining occupation-associated electronic data processing systems
- operating hand and power tools
- performing installation of, and modification to, assigned equipment

(Canadian Armed Forces, 1987, RIA 0222-87E).

Advanced occupational training, upon demonstrated ability and aptitude, would include: "Facility Message Switching System, Transportable Communications Stations Terminal Equipment, and Commander Key Telephone Maintenance" (Canadian Armed Forces, 1987, RIA 0222-87E).

TELETYPE AND CIPHER TECHNICIAN (223)

Personnel, selecting or assigned to this trade, would be responsible for "maintaining mainframes, micros and peripheral equipment" (Canadian Armed Forces, 1986, p. 17) as well as learning how to "install, maintain, modify, overhaul, and complete operational checks on teleprinted and associated equipment" (p. 17). These skills would be taught during a 20 week course at Canadian Forces School of Communications and Electronics. The courses which would supply these practical skills are

> maintenance of electronic and mechanical equipment, data terminals, cipher devices, miscellaneous equipment such as patch panels, modems, acoustic couplers, and distribution frames
> (Canadian Armed Forces, 1987, RIA 0223-87E).

Additional occupational courses available to personnel seeking rank promotion within their career would be: NATO Integrated Communication System Facility Technical Control, and Crypto KY57/58 Vinson Third Line Maintenance (Canadian Armed Forces, 1987, RIA 0223-87E).

RADAR TECHNICIAN (231)

A Radar Technician upon completion of a 17 week course at the Canadian Forces School of Communications and Electronics, would be required to

> maintain, overhaul, modify and install various mobile and fixed radar systems. These systems include long range search radar, data processors and computers, as well as navigation, meteorological, electronic warfare, identification and land combat radars (Canadian Armed Forces, 1986, p. 16).

Personnel, assigned or selecting this trade, would be instructed in the maintenance, modification, removal, overhauling, and installation of "radar systems and ancillary equipment (Canadian Armed Forces, 1987, RIA 0231-87E). Advanced military occupation and specialty training courses are also available to personnel interested in working with sophisticated radar and computer systems.

ELECTRO-MECHANICAL TECHNICIAN (431)

The fifth occupation which requires a strong background in electronics for personnel desiring to be employed mainly in the Land element is that of Electro-Mechanical Technician. The Electro-Mechanical Technicians, upon completion of 15 weeks at the POET program, or immediately if they are enrolled through STEP, will commence a 24 week course at Canadian Forces School of Electrical and Mechanical Engineering at Borden, Ontario.

The courses taught are a combination of theory and practical application in the following areas:

- basic electronic theory
- basic optical theory
- repair of instruments (mechanical and optical)
- repair of electrical and electronic equipment
- repair of Armoured Vehicle General Purpose optronic devices
- Field environmental skills

(Canadian Armed Forces, 1987, RIA 0431-87E).

Upon completion of these courses, the Electro-Mechanical Technicians would be required to "inspect, test, adjust and repair electro-mechanical equipment and associated optical, mechanical, electrical and electronic components used by the Combat Arms units" (Canadian Armed Forces, 1986, p. 19). Advanced training for future formal or on the job training courses would include "maintenance of digital computers, thermal sights and maintenance of simulators and trainers" (Canadian Armed Forces, 1987, RIA 0431-87E).

MILITARY TRADE OCCUPATIONS (VOCATIONAL)

In addition to the various electronic-based military occupations which may require a junior matriculation from a secondary school or a diploma from a recognized technical institution as prerequisites for enrollment, there are numerous vocational-based occupations which make up the majority of Canadian Forces occupations. These vocational occupations are diverse in content as the Canadian military infrastructure requires self-dependency from the civilian sector in order to maintain and to complete its requirements.

With the exception of Combat Arms trades and various weapon technician occupations, the majority of military occupations will have civilian counterpart employment. These military occupations, like the electronic-based occupations, require occupational training at a military location followed by on the job training at an assigned location. The following vocational occupations will be examined: Lineman, Air Traffic Control Assistant, Materials Technician, Fire Fighter, Medical Assistant, Cook, and Postal Clerk.

LINEMAN (052)

The role of the Lineman is to "provide the field or line communications link between units in operational or non-operational situations" (Canadian Armed Forces, 1991, RIA 052-91B). In order to accomplish this role, a Lineman will be required to

> - construct, inspect, and test overhead, underground and underwater communications wire and cable plants at both permanent and land operations locations
> - supervise, install and connect terminal and field telephone equipment to telephone lines, radio relay and line transmission equipment
>
> (Canadian Armed Forces, 1991, RIA 052-91B).

The training for this occupation takes place for 13 weeks at Canadian Forces School of Communications and Electronics. Basic skills developed will be

> climbing telephone poles and towers, constructing telephone pole routes for suspending lines, laying telephone lines in combat situations, operation and

connection of a combat switch-board, installation, servicing and trouble-shooting of telephones and lines (Canadian Armed Forces, 1991, RIA 052-91B).

AIR TRAFFIC CONTROL ASSISTANT (162)

The Air Traffic Control Assistant occupation is an example where the Canadian Forces utilizes civilian instructors in preparing personnel for this occupation. Upon acceptance to this occupation, personnel will attend a four week course at a Canadian Forces base which has flying operations, for familiarization and on the job training. The formal aspects of this vocational training will be conducted over nine weeks at the Canadian Forces Air Traffic Control Training Unit which is located at the Transport Canada Training Institute in Cornwall, Ontario. The instructors, who are civilian Air Traffic Controllers from various airport locations across Canada, instruct military and civilian personnel in

- operation of ATC consoles
- radiotelephony (R/T) and ATC communications
- aircraft movement and control messages and reports
- flight planning and airfield services
- navigation and approach aids
- aviation weather reports and forecasts
- alerting procedures for emergency and overdue aircraft
- radio direction finding

(Canadian Armed Forces, 1983, RIA 0162-83E).

MATERIALS TECHNICIAN (441)

The training requirements for a Materials Technician are more demanding than many other occupations. Personnel training for this occupation will attend a 35 week course at Canadian Forces School of Electrical and Mechanical Engineering. During this course, personnel will be instructed in

- shop mathematics
- interpretation of mechanical drawings and blueprints
- proper use of power and hand tools
- metallurgy
- pattern development and layout
- Magnesium Inert Gas, Tungsten Inert Gas, and oxy-acetylene welding
- metal surface refinishing
- autobody repair and refinishing
- spray painting
- drilling, threading, and reaming
- lathe turning
- textile repair
- fiberglass repair
- rough carpentry

(Canadian Armed Forces, 1987, RIA 0441-87E).

This extensive training for a Materials Technician provides skilled personnel with the ability to be successful when "employed in direct maintenance support of all land vehicles and associated equipment" (Canadian Armed Forces, 1986, p. 19). This training is maintained and upgraded on a regular basis by the nature of the employment. It would be impossible for any educational institution to provide technical or vocational training in every aspect of that particular trade. An example of this ability to take what has been taught, made practical by on the job training, and adapted to new situations is the mechanical division at 202 Workshop Depot in Montreal, Quebec. The purpose of 202 Workshop is to "provide complete weapon systems repair and overhaul for the Canadian Forces...to repair everything from bayonets to Leopard tanks" (King, 1992, p. 9). The ancillary shop, one of four shops within the mechanical division, is required to "repair gas masks, do bodywork on vehicles, carpentry and painting" (p. 9). In addition to continuous training to maintain expertise in their trade, electrical technicians from the electrical division "also keep up their education themselves, brushing up with technical manuals and magazines" (p. 9). The preparation depth of product knowledge is given a high priority in the engineering services division. A team of engineers and technicians have been analyzing, since 1988, a M-109 self propelled howitzer; "Every step of the rebuild project, from preparing diagrams of every component to identifying tools and equipment to dismantle, rebuild and reassemble the vehicles, has been planned" (p. 9). It is this example of "hands on practice" and "on the job" training that makes these vocational occupations extremely important to the Canadian Forces in order to maintain the infrastructure.

FIRE FIGHTER (651)

The Fire Fighter is one example of a military occupation which operates closely to its civilian counterpart. Firefighters normally work on a rotating shift covering 24 hours a day. After completion of basic military training, firefighters attend a three week driving course followed by an intensive 15 week course at the Canadian Forces School of Aerospace and Ordnance Engineering located at Borden, Ontario. The learned skills for this occupation include

- care and use of hand tools, power tools, respiratory equipment, fire ladders, fire hoses, and other related equipment
- characteristics of fire, fire chemistry, classification of extinguishment
- use and maintenance of fire extinguishers
- operation and maintenance of fire fighting equipment and vehicles
- rescue techniques, fire fighting techniques and conduct of fire inspections.

(Canadian Armed Forces, 1983, RIA 0651-83E).

Firefighters are also required, throughout their courses to inspect and test fire alarms, water distribution, automatic fire protection systems, and to conduct fire inspections of all facilities (Canadian Armed Forces 1986, p. 23). Advanced trade training through formal courses and on the job training will include "Fire Vehicle Operation, Hydrostatic Testing Techniques, Fire Inspection Techniques, and Fire Investigation" (Canadian Armed Forces, 1983, RIA 0651-83E).

MEDICAL ASSISTANT (711)

A Medical Assistant enrollee is required to have a minimum educational of Grade 10 or equivalent. Upon completion of basic courses, a Medical Assistant will spend the first part of their career in operational situations where he/she is expected to work as part of a medical team assisting military doctors and nurses in the treatments of surgical and medical patients.

An enrollee will attend the Canadian Forces Medical Services School at Borden, Ontario, for a 12 week course in which he/she will learn:

> anatomy and physiology, field medical service, emergency medical care, therapeutic drug usage, preventive medicine, medical documentation, and nursing procedures including surgical nursing and medical nursing (Canadian Armed Forces, 1991, RIA 711-91B).

Upon completion of the 12 week course, a Medical Assistant will spend an additional five weeks training in a Canadian Forces Hospital prior to assignment in diverse locations. As a Medical Assistant obtains seniority, he/she will have the opportunity after additional formal and practical courses to remuster into specialized medical occupations such as: "Laboratory Technician, Operating Room Assistant, Preventive Medicine Technician, X-ray Technician" (Canadian Armed Forces, 1986, p. 22).

COOKS (861)

One of the advantages for civilians interested in a cooking occupation within a military career is the above average pay they receive in comparison to their civilian counterparts. Upon completion of the 10 week basic military training, cook enrollees attend a 20 week course at Canadian Forces School of Administration and Logistics at Borden, Ontario. Courses covered include

> cookery terms, weights and measures, basic cooking and butchering, small and large quantity cooking, field cooking, food handling and hygiene, ration accounting, fire and safety precautions, and inventory control (Canadian Armed Forces, 1991, RIA 861-91B).

As in all other military occupations, the opportunity for advanced training through formal courses or on the job training is available to all personnel. Cooks can advance their rank promotion through the completion of courses such as: "Advanced Bake Shop, Kitchen Design and Layout, Buffet Decoration, Hospital Food Services, Instructional Techniques, and Sea Environment Training" (Canadian Armed Forces, 1991, RIA 861-91B).

POSTAL CLERK (881)

Of all the military occupations that are most probably taken for granted by other personnel who expect these services to be available upon demand, Cooks and Postal Clerks would fall into this category. In the military environment, it is traditional to complain about the food being served and the lateness of delivered mail. In reality, the ability of Cooks to supply meals at every location where personnel serve, and the ability of Postal Clerks to ensure delivery of mail, considering the mobility of personnel, speaks highly of the competence of the personnel involved and of their previous training.

The purpose of the Postal Clerk is to provide the military with a full range of postal services at Canadian Forces Bases and establishments. Postal Clerk enrollees attend a four week course at Canadian Forces Postal Unit in Trenton, Ontario to be instructed in the following courses:

> receipt, handling, sorting, redirecting, delivering and dispatch of all classes of mail, safeguarding mail, recognizing and reporting mail irregularities, interpretation of postal laws and regulations, repair of damaged mail, care and maintenance of postal equipment, typing, filing and office procedures (Canadian Armed Forces, 1983, RIA 0881-83E).

As in all occupations, personnel are expected to advance their occupational learning and career by involvement in advanced trade training and specialty training courses. Postal Clerks have the opportunity for the following courses: "Personnel Management, Postal Administration, Financial Accounting and Audit, and Instructional Techniques" (Canadian Armed Forces, 1983, RIA 0881-83E).

SUMMARY

Since the postwar years the Canadian military has increased its reliance upon technical advancements which dominate all aspects of Canadian society. This reliance upon technology has also required the Canadian military to be at the foremost in obtaining or training skilled technicians in order to complete any assignments given by the federal government. The technical requirements of many postwar military occupations have also forced the military to adapt its recruiting policies in order to obtain better qualified recruits. These technical requirements and the changing socio-demographics of Canadian society with regards to higher education levels have forced the Canadian military to compete with post secondary institutions and the civilian employment sectors for better qualified recruits.

In order to obtain better qualified recruits and to decrease the attrition rate within the Canadian Forces, several adaptive programmes had been implemented. Several of these programmes are the Land Operations Trade Reassignment Programme which remusters current personnel into specialized military trades; the Skilled Trades Entry Plan which obtains skilled technicians from recognized post secondary institutions; and the Performance Oriented Electronics Training which is an internal technical training programme.

Vocational occupation requirements for the Canadian Forces is conducted through individual training at 19 schools designed to supply all support services requirements. This continuous training requires all personnel to train and upgrade their specialized occupations throughout their military career.

Various examples of military occupations, whether technical or vocational, have been provided to demonstrate the military requirements to maintain an efficient and effective infrastructure to comply with policy changes as dictated by the Canadian government. The two major policy changes which demonstrate the effectiveness of the Canadian military are arbitrary imposed personnel numbers which forces the military to maintain its infrastructure with fewer personnel and increased demands to provide the United Nations with peacekeeping forces which are self-sufficient and able to provide technical or vocational services to foreign regions which require United Nations assistance.

CHAPTER Vl

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY

INTRODUCTION

It is with a sense of reluctance the researcher has reached the final chapter of this research. In one aspect there is a satisfaction in the completion of educational research which has not been fully explored by other researchers; in another aspect there is a reluctance in the knowledge that this research has only scratched the surface of a research topic which could be expanded in greater depth and scope.

SUMMARY

The development of technical and vocational training in the Canadian military infrastructure had its genesis in the Militia Act (1855) which established the foundation for the creation of an independent Canadian military within the framework of British military traditions. The concept of traditions, particularly military traditions, is to utilize and to maintain the lessons learned in the achievements of previous campaigns. The infantry methods of combat in the Napoleonic Wars which culminated at the Battle of Waterloo (1815) were still in use during the Crimean War (1854-1856) and the same traditions were relied upon by the fledgling Canadian army during the Riel Rebellion of 1885. Reliance upon the validity of cultural traditions were still evident in 1909 at the Imperial Defence Conference in which agreement was reached for "harmonizing the military forces of Britain and the colonies in such a way that in an emergency they could be easily combined into a single fighting force" (Foster, p. 80). This agreement ensured the continuance of British military traditions in the Canadian army at the expense of ignoring the "Canadian abilities for river, mountain, and forest terrain and acclimatization for cold weather combat" (p. 80). Britain's ongoing "bush wars" in Asia and Africa in the latter part of the nineteenth century and prior to the First World War coupled with "jingoism" media reports to the civilian population ensured the continuance of traditions within the military framework. Poets such as Kipling and Sir Henry Newbolt emphasized the positive values of British traditions regardless of geographic location. The underlying message in Newbolt's poem **Vitai Lampada** was not lost upon its British audience or upon its Canadian audience;

> The sand of the desert is sodden red,
> Red with the wreck of a square that broke;
> The Gatling's jammed and the Colonel dead,
> And the regiment blind with dust and smoke.
> The river of death has brimmed his banks,
> And England's far, and Honour a name,
> But the voice of a schoolboy rallies the ranks:
> "Play up! Play up! and play the game!"
> (Newbolt, 1984, p. 95)

An example of this fervor for maintaining established traditions in the Canadian army was manifested by Sir Sam Hughes, Minister of Militia, responsible for mobilizing the

Canadian army upon the outbreak of war in August, 1914. On one occasion accompanied by a cavalry escort, Hughes rode up to a battalion as it drilled and shouted for the battalion to form a square;

> The men, many of whom were having difficulties as it was, were dumbfounded by the order, which had been dropped from the training manual years before. Fortunately, one grizzled corporal remembered the formation and eventually shuffled Yates and the others into the proper position, kneeling in a square with bayonets fixed (Dancocks, 1989, p. 60).

By the conclusion of the First World War the Canadian military were innovative in the creation of specialized Corps such as The Royal Canadian Corps of Signals, The Royal Canadian Army Medical Corps, The Royal Canadian Dental Corps, The Royal Canadian Ordnance Corps, The Corps of Royal Canadian Electrical and Mechanical Engineers, The Royal Canadian Postal Corps, Canadian Overseas Railway Construction Corps, and the Canadian Forestry Corps. While several of these ancillary Corps were organized prior to the First World War or received the "Royal" status during the First World War or in the Second World War, it was the innovative spirit conducted during hostilities which provided the technical and vocational requirements.

The political tendency to down size military forces during peaceful environments affected the quality of the Canadian military to provide or to maintain technical and vocational training within its structure. The advent of hostilities in 1939 and the growing awareness of the methods employed to conduct "modern" wars during the Second World War provided the rationale by the Canadian military to establish technical and vocational training schools within specialized Corps.

In addition, the Canadian military at the request of serving personnel provided educational programs designed for the rehabilitation of military personnel upon return to civilian employment. These rehabilitation programmes in part were conducted through correspondence courses aided by the assistance of The Canadian Legion in order to "assist men in improving their knowledge of technical subjects important to their duties" (Stacey & Wilson, 1987, p. 125). Prior to the invasion of Axis controlled Europe in 1943, "3,733 men were taking Canadian Legion correspondence courses, 1,073 taking similar British courses, and 315 taking courses at the university level" (p. 128) while "each month an average of 6,000 men were attending classes, often in civilian schools" (p. 128). The educational courses served two purposes: the first being to provide educational upgrading for soldiers "to combat boredom among troops awaiting repatriation" (p. 131) and the second to "help men and women to prepare themselves for the return to civilian life" (p. 131).

There are two main reasons why the Canadian military placed emphasis upon technical and vocational skills in the post war years. The first reason was the perceived military threat to Western European and North American security from the Soviet Union required the Canadian military to maintain the technical and vocational skills of the ancillary corps. To this purpose the Canadian military provided continuous training for all of its personnel. The second reason was that rapid advancements in military technology and the continued dependance upon lower educated recruits also forced the Canadian military to maintain technical and vocational schools in order to acquire skilled personnel. This was achieved by the concept of continuous training of all personnel in their military occupations during their careers.

The Canadian Forces were affected by the changing socio-demographics of Canadian society in the 1970s with regards to difficulties in obtaining better educated recruits. The increased retention levels at secondary institutions and rapidly growing community colleges and other post secondary institutions forced the military to utilize adaptive programmes to obtain and to retain skilled technicians. These adaptive programmes were designed to recruit skilled technicians from Canadian society or to provide the necessary training for technical or vocational skills to military personnel. All military occupations in the Canadian Forces require formal training courses of various lengths of time supplemented with informal "on the job" training. In addition personnel will proceed to formal advance courses as they progress in their careers supplemented with constant on the job training and instruction of subordinate ranks.

CONCLUSIONS

From data collected and analyzed for this descriptive study of technical and vocational training in the Canadian military the following conclusions can be established.

The adaptation of available technology in the nineteenth century were hindered in the belief by the military of the values of British military traditions which limited the utilization of available technology. Railroads, telegraphs, telephones, wireless communications, motor vehicles, and other apparatus which were electric or mechanical in nature were never fully capitalized upon by the military until after general acceptance and use by the civilian population. The established role of the military was to provide "field soldiers" as an instrument of the government. Even though the military were left to their own devices to achieve their assigned goals, the concept of "military tradition" ignored the availability of technology. The Canadian military, like all other military forces of the nineteenth century, engaged civilians to provide them with the advantages of technology upon requirement. The traditional "beliefs" held by senior officers included the rejection of technology until its acceptance by the civilian host society and its "value" was demonstrated by mass production. This viewpoint regarding the rejection of established technology lingered into the twentieth century by the Canadian military even after the advantages of military control of various technical skills were made evident during the First World War.

The rapid demands for electrical and mechanical devices by the military during the Second World War demonstrated an acceptance of technology which had not been understood a generation earlier. An increased awareness and use of technical devices forced the Canadian military to commence the technical and vocational training of military personnel. This reliance upon technology continued in the post war years with the introduction of formal and informal trades training programmes. As the nature of the military organization is to be self-sufficient in its operations, the Canadian military organization through its internal technical and vocational training programmes can be considered to be an effective organization. The Canadian Forces training schools and current training programmes such as POET and STEP provide the Canadian military with skilled personnel possessing the ability to operate and to maintain the standards of expertise required. An examination of various military occupations specification sheets for technical and vocational trades which list the initial formal training courses demonstrates the vast scope of technical and vocational skills required by military personnel.

The competition between the civilian employment sector and military requirements for entry level employees in light of a decreasing manpower supply between the ages of 17 and 24 years has produced effective recruiting procedures to obtain versatile or skilled applicants. The procedures used to obtain recruits places a high priority upon technical and vocational trades. Recruit applicants are made cognizant of available trade occupations and the applicants selected are introduced to various aspects of military trade occupations and employment requirements prior to enlistment.

The purpose of this descriptive study is to document and analyse the procedures used by the Canadian military to provide technical and vocational training to their personnel. This purpose is supported through several supporting objectives: the first objective to identify the origins and evolution of technical and vocational training in the Canadian military from 1855 to 1992; the second objective to examine current procedures used in obtaining and training military personnel; and the third objective to document the extensive requirements for occupational training conducted by the Canadian military to maintain its infrastructure as a self-reliant organization.

The contents of Chapters 111, 1V, and V provide the depth and scope of the primary purpose supported by the three secondary objectives. Despite the "road-blocks" of the limitations which made the obtaining of resources "difficult" it can be established as a final conclusion that this descriptive study provides a detailed account of technical and vocational training in the Canadian military from 1855 to 1992. This belief by the researcher in the validity of the final conclusion must be tempered by the reality of the complexity of the Canadian military infrastructure. Cotton's (1979) statement, "no one researcher or team of researchers could fully depict its character. One is constrained to simplify issues..." (p. 6) establishes the rationale for additional educational research in this field. The recommendations for further study are drawn from these conclusions.

RECOMMENDATIONS FOR FURTHER STUDY

The following recommendations are based on the findings of this research.

The lack of available information on technical and vocational trades or training in the Canadian military conducted by previous researchers leaves a serious gap in the comprehension of adult education and its effect upon one of the largest "employers" in Canada. It would be appropriate for Canadian Forces Personnel Applied Research Unit (CFPARU) to conduct a descriptive survey of technical and vocational training in the Canadian Forces. A published descriptive survey should also be deposited in designated post-secondary institution libraries to assist future researchers in this particular area.

The Canadian Forces could also assist researchers by making available to post-secondary institutions bound copies of trade occupation specification sheets which provide specific information on initial formal training courses. Any additions or deletions in terms of trade occupations or contents of courses should be revised on a periodic basis and updated editions deposited with designated libraries.

In order to assist educational researchers the Canadian Forces should relax the security classification system in relation to publications dealing with trade occupations courses. If this could be achieved then there should be made available from a central location a published bibliography of curriculum guides for the instructing of trade occupations made available to researchers.

In the review of literature difficulties became apparent in obtaining secondary materials relevent to this descriptive survey. The rationale by published authors of the minor roles allotted to ancillary corps needs to be re-evaluated and allowances made in future editions of published sources.

The final recommendations regarding technical and vocational training in the Canadian Forces is for future researchers in this area. This research is unique in its compilation of data and could be explored further in several avenues. There is a need for future research in the area of military technical and vocational training in the Canadian military which would be greater in depth and scope. This future research requires the active support of an educational institution to assist the researcher in being able to gain access to visitation to the various locations of technical and vocational training in the Canadian Forces. There is also a need for future research in this area to concentrate on the availability of technology in the nineteenth century and prior to the First World War and the reasons for the limited military utilization of available technology. The radical impact of technology upon military structures during the Second World War should also be explored further in terms of the need for and the methods employed by the military to instruct adults in acquiring technical or vocational skills. Finally, it is recommended that future research be conducted to provide comparisons with military technical and vocational training and adult based civilian technical and vocational training.

Bibliography

References

Abbott, E. (Ed.). (1990). **Chronicle of Canada.** Montreal: Chronicle Publications.

Barnett, C. (1974). **Britain and her army: 1509-1970.** London: Penguin Books.

Berton, P. (1986). **Vimy**. Toronto: McClelland and Stewart Ltd.

Casselman, A. (1974). **Richardson's War of 1812.** Toronto: Coles Publishing Company.

Cooper, J. (1920). **The story of Canada in the Great War**. New York: P.F. Collier and Sons Co.

Dancocks, D. (1986). **Legacy of valour: the Canadians at Passchendaele.** Edmonton: Hurtig Publishers.

Dancocks, D. (1989). **Welcome to Flanders Field.** Toronto: McClelland and Stewart Inc.

Dancocks, D. (1990). **Gallant Canadians: the story of the 10th Canadian infantry battalion 1914-1919.** Calgary: The Calgary Highlanders Regimental Fund Foundation.

Denison, G. T. (1901). **Soldiering in Canada: Recollections and experiences.** Ottawa: George Morang & Co.

Department of Manpower and Immigration. (1971). **Canadian classification and dictionary of occupations**. volume 1. Ottawa: Information Canada.

Driedger, E. A. (1967). **A consolidation of the British North American Acts: 1867-1965.** Ottawa: Queen's Printer.

Foster, J. A. (1987). **Muskets to missles: a pictorial history of Canada's ground forces.** Toronto: Methuen Publications.

General Staff, War Office. (1914). **Field service pocket book 1913.** London: Harrison and Sons.

Goodspeed, D. J. (1967). **The Armed Forces of Canada 1867-1967: a century of achievement.** Ottawa: Canadian Forces Headquarters.

Granatstein, J. L. & Morton, D. (1989). **A nation forged in fire: Canadians and the Second World War 1939-1945.** Toronto: Lester & Orpen Dennys Publishers.

Granatstein, J. L. & Bercuson, D. (1991). **War and peacekeeping: from South Africa to the Gulf - Canada's limited wars.** Toronto: Key Porter Books Ltd.

Hamilton, C. F. (1914). Defence, 1812-1912. **Canada and its provinces.** 7. Toronto: Edinburgh University Press.

Harris, S. J. (1988). **Canadian brass: the making of a professional army 1860-1939.** Toronto: University of Toronto Press.

Howard, M. (1977). **War in European history.** London: Oxford University Press.

James, L. (1985). **The savage wars: British campaigns in Africa 1870-1920.** New York: St. Martin Press.

Johnston, M. (1983). **Canada's craftsmen: the story of the Corps of Royal Canadian Electrical and Mechanical Engineers and of the Land Ordnance Engineering Branch.** No publisher or location recorded.

Kenyon, W. A. & Turnbull, J. R. (1971). **The battle for James Bay 1686.** Toronto: Macmillan of Canada Company.

Marteinson, J. (1992). **We stand on guard: an illustrated history of the Canadian Army.** Montreal: Ovale Publications.

Massey, H. J. (1972). **The Canadian military: a profile.** Toronto: Copp Clark.

Morton, D. (1972). **The last war drum: the north west campaign of 1885.** Toronto: Hakkert Ltd.

Morton, D. (1992). **A military history of Canada: from Champlain to the Gulf War** (3rd ed.). Toronto: McClelland & Stewart.

Morton, D. & Granatstein, J. L. (1989). **Marching to Armageddon: Canadians and the Great War 1914-1919.** Toronto: Lester & Orpen Dennys Publishers.

Newbolt, H. (1984). **Selected poems of Henry Newbolt.** London: Trafalgar.

Nicholson, G. W. L. (1977). **Seventy years of service: a history of the Royal Canadian Medical Corps.** Ottawa: The Borealis Press.

Otter, W. D. (1914). **The Guide: A manual for the Canadian Militia (Infantry)**. Toronto: The Copp, Clark Company.

Pacey, A. (1989). **The maze of ingenuity: ideas and idealism in the development of technology**. Cambridge, Massachusetts: The MIT Press.

Peel, B. (1972). **Steamboats on the Saskatchewan.** Saskatoon: Prairie Books.

Popham, W. J. (1988). **Educational evaluation**. Englewood Cliffs, New Jersey: Prentice Hall.

Rannie, W. F. (1984). **To the thunderer his arms: The Royal Canadian Ordnance Corps**. Lincoln, Ontario: W. F. Rannie Publisher.

Stacey, C. P. (1948). **The Canadian Army, 1939-1946**. Ottawa: Queen's Printer.

Stacey, C. P. & Wilson, B. M. (1987). **The half-million: the Canadians in Britain, 1939-1946**. Toronto: University of Toronto Press.

Stanley, G. (1974). **Canada's soldiers: the military history of an unmilitary people**. Toronto: McMillian.

Stewart, C. H. (1962A). **The concise lineages of the Canadian army: 1855 to date**. Toronto.

Stewart, C. H. (1962B). **The service of British regiments in Canada and North America**. Ottawa: National Defence.

Steele, S. (1972). **Forty years in Canada**. Toronto: McGraw-Hill Ryerson Limited.

Strange, T. B. (1988). **Gunner Jingo's jubilee**. Edmonton: The University of Alberta Press.

Swettenham, J. (1973). **Valiant men: Canada's Victoria Cross and George Cross winners**. Toronto: Hakkert Ltd.

Van Dalen, D. (1962). **Understanding educational research**. New York: McGraw-Hill Book Company.

Wallace, W. S. (1919). **Canada in the Great War**. Toronto: Johan A. Hertel Company.

Willett, T. C. (1987). **A heritage at risk: the Canadian militia as a social institution**. Boulder and London: Westview Press.

Wood, H. F. (1966). **Strange battleground: official history of the Canadian army in Korea**. Ottawa: Queen's Printer.

Wright, Q. (1965). **A study of war**. Chicago: University of Chicago Press.

Canadian Armed Forces Publications

Angus, R. J. (1984). **Basic electronics training in the Canadian Forces: instructors' impressions of student problem areas**. (Technical Note 19/84). Willowdale, Ontario: Canadian Forces Personnel Applied Research Unit.

Canadian Armed Forces. (1983). **Air Traffic Control Assistant 162**. (RIA 0162-83E). No publisher listed.

Canadian Armed Forces. (1986). **Careers in the Canadian Armed Forces for non-commissioned members**. (RIA 400-86B). No publisher listed.

Canadian Armed Forces. (1991). **Cook 861**. (RIA 861-91B). No publisher listed.

Canadian Armed Forces. (1987). **Electro-Mechanical Technician 431**. (RIA 0431-87E). No publisher listed.

Canadian Armed Forces. (1983). **Field Engineer 041**. (RIA 0041-83E). No publisher listed.

Canadian Armed Forces. (1983). **Firefighter 651**. (RIA 0651-83E. No publisher listed.

Canadian Armed Forces. (1991). **Lineman 052**. (RIA 052-91B). No publisher listed.

Canadian Armed Forces. (1987). **Materials Technician 441**. (RIA 0441-87E). No publisher listed.

Canadian Armed Forces. (1991). **Medical Assistant 711**. (RIA 711-91B). No publisher listed.

Canadian Armed Forces. (1987). **Medical Laboratory Technician 714**. (RIA 0714-87E). No publisher listed.

Canadian Armed Forces. (1983). **Metals Technician 561**. (RIA 0561-83E). No publisher listed.

Canadian Armed Forces. (1991). **Performance Oriented Electronics Training (POET) 490**. (RIA 490-91B). No publisher listed.

Canadian Armed Forces. (1983). **Postal Clerk 881.** (RIA 0881-83E). No publisher listed.

Canadian Armed Forces. (1987). **Radar Technician 231.** (RIA 0231-87E). No publisher listed.

Canadian Armed Forces. (1987). **Radio Technician 221.** (RIA 0221-87E). No publisher listed.

Canadian Armed Forces. (1983). **Supply Technician 911.** (RIA 0911-83E). No publisher listed.

Canadian Armed Forces. (1988). **STEP: Skilled Trades Entry Plan.** (RIA 419-88B). No publisher listed.

Canadian Armed Forces. (1987). **Teletype and Cipher Technician 223.** (RIA 0223-87E). No publisher listed.

Canadian Armed Forces. (1987). **Terminal Equipment Technician 222.** (RIA 0222-87E). No publisher listed.

Canadian Armed Forces. (1983). **Vehicle Technician 411.** (RIA 0411-83E). No publisher listed.

Canadian Dental Corps serves three arms. (1945, August). **Canadian Army Training Memorandum** 53. pp. 7-9.

Canadian Forestry Corps wins its battles. (1946, January). **Canadian Army Training Memorandum** 58. pp. 6-10.

Chatelain, J. (1992). All eyes and ears. **Sentinel**, 28(1), p. 32.

Classes at Longue Pointe. (1946, May). **Canadian Army Training Memorandum** 62. pp. 18-21.

Classes crowded at S17. (1946, January). **Canadian Army Training Memorandum** 58. pp. 23-25.

Cotton, C. (1974). **Unskilled male recruits for the Canadian Forces: trends and projections to 1985** (Report 74-5). Downsview, Ontario: Canadian Forces Personnel Applied Research Unit.

Cotton, C. (1975). **Labour mobility patterns and military manpower supply in Canadian society** (Technical Report 75-2). Downsview, Ontario: Canadian Forces Personnel Applied Research Unit.

Cotton, C. (1979). **Military attitudes and values of the army in Canada.** (Research Report 79-5). Willowdale, Ontario: Canadian Forces Applied Research Unit.

Department of National Defence. (1975). Canadian Forces Manual of Military Occupations, CFP 123(1). **A description of the Canadian Forces men's trade system.** Ottawa: Training Command.

Department of National Defence. (1988). **Defence 88.** Ottawa: Minister of Supply and Services Canada.

Donnelly, P. G., Cotton, C. & Tierney, E. C. (1980). **Factors affecting the stay/leave decision of post pay level 3 graduates** (Working Paper 80-1). Downsview, Ontario: Canadian Forces Personnel Applied Research Unit.

Dorge, M. (1990). 25 years for Sentinel. **Sentinel**, 26(6), pp. 22-23.

Ellis, R. T. and Angus, R. J. (1985). **Matching CFCIS vocational preference checklist items with probability of adjustment to entry-level CF trades: a research plan** (Technical Note 17/85). Willowdale, Ontario: Canadian Forces Personnel Applied Research Unit.

Hamel, C. (1987, June). **Canadian Forces Socio-Demographic Trends Information System.** Paper presented at the 23rd International Applied Military Psychology Symposium, Lisbon, Portugal.

Historical note on army education. (1946, March). **Canadian Army Training Memorandum** 60. pp. 31-33.

How its done at A16. (1946, April). **Canadian Army Training Memorandum** 61. pp. 24-25.

Khaki Collegiate. (1945, December). **Canadian Army Training Memorandum** 57. pp. 28-30.

Khaki school at Camp Niagara. (1946, January). **Canadian Army Training Memorandum** 58. pp. 20-21.

King, D. (1992.). Bayonets to leopards. **Sentinel**, 28(1), pp. 9-10.

Park, R. E. (1982). **Trends in recruit quality: an analysis of enrollee profiles across recruit zones from July 1980 to June 1982** (Technical Note 5/82). Willowdale, Ontario: Canadian Forces Personnel Applied Research Unit.

Pelletier, D. (1984, May). **The Canadian Forces Career Information System.** Paper presented at the Canadian Guidance and Counselling Association Annual Conference, Winnipeg, Manitoba.

Pinch, F. C. and Cotton, C. A. (1976). **Expanding the recruit market for other rank personnel in selected military trades** (Report 76-5). Toronto, Ontario: Canadian Forces Personnel Applied Research Unit.

Pinch, F. C. and Cotton, C. A. (1978, August). **Education, change and military adaptation in Canada**. Paper prepared for presentation at the 9th World Congress of Sociology, Uppsala, Sweden.

Postal Corps training. (1945, December). **Canadian Army Training Memorandum** 57. p. 11.

Precedence of Corps. (1944, August). **Canadian Army Training Memorandum** 41. p. 48.

They're learning to be butchers. (1945, December). **Canadian Army Training Memorandum** 57. pp. 32-33.

Tierney, E. C. and Pinch, F. C. (1980). **Military implications of socio-demographics and related changes in the 1980's and 1990's** (Working Paper 80-4). Willowdale, Ontario: Canadian Forces Personnel Applied Research Unit.

Tivendell, J. and Gaudet, J. W. (1985). **Socio-demographics trends and related changes in Canadian society affecting the Canadian Forces personnel supply** (Research Report 85-2). Willowdale, Ontario: Canadian Forces Personnel Applied Research Unit.

Trades training overseas. (1946, February). **Canadian Army Training Memorandum** 59. p. 43.

Typewriting class. (1945, December). **Canadian Army Training Memorandum** 57. p. 34.

Wilson, F. P. and Flynn, J. A. (1982). **Introduction of Trade and Lifestyle Videotapes (TLVs) into a Canadian Forces vocational counselling setting** (Report 82-1). Willowdale, Ontario: Canadian Forces Personnel Applied Research Unit.

Periodicals

Boshier, R. (1985). Revolting soldiers: the origins of education in the armies of the empire in world war 1. **Learning**, 4(2), pp. 17-19.

Cotton, C. (1980). Educational change and the military labor market in Canada. **Interchange** 11(3), pp. 33-41. Toronto.

Grimshaw, L. E. (1991 Autumn). No. 1 armoured train. **Canadian Defence Quarterly, 21(2)**, 40-44.

McNeil, R. (1970, Sept./Oct.). Performance oriented electronics training for the Canadian Armed Forces. **Canadian Training Methods** 3(4). pp. 14-16.

Theses

Horton, D. S. (1980). **Effect of expectations on attrition in Canadian Forces recruit training**. Unpublished master's thesis, University of Calgary, Alberta.

Rainsforth, R. (1991). **Evolution of apprenticeship in Alberta to 1990**. Unpublished master's thesis. University of Alberta.

Yee, T. L. (1977). **A description of the procedures used for civilian accreditation of military occupations in Canada**. Unpublished master's thesis, University of Alberta.

PERSONAL INTERVIEWS

Porter, Captain. 1st Service Battalion, Canadian Forces Base Calgary. November 24, 1992.

Seyffert, Chief Warrant Officer. 1st Service Battalion, Canadian Forces Base Calgary. December 7, 1992.

Thompson, Chief Warrant Officer. 1st Service Battalion, Canadian Forces Base Calgary. December 7, 1992.

APPENDIX A

Correspondance by Dr. Konrad to CFPARU requesting release of publications considered important to the research.

University of Albe
Edmonton
Canada T6G 2G5

Adult, Career and Tecl logy Education
Faculty of Education
633 Education South, Telephone (403) 492-3678
Fax (403) 492-0236

November 18, 1991

Mr. F.P. Wilson, Commanding Officer
Canadian Forces Personnel
Applied Research Unit
Suite 600, 4900 Yonge Street
Willowdale, ON M2N 6B7

Dear Commander Wilson:

I am writing on behalf of Leslie E. Champ, a graduate student in technical/vocational education at the University of Alberta.

On 8 February, 1991 (File 1200-1 RPA) you wrote Leslie Champ to offer your support in providing documentation for his research on technical and vocational education in the Canadian Forces. Mr. Champ has shared his dilemma with me in that it would be impossible to adequately research the technical and vocational education in the Canadian Forces by examining only 10 publications. We have carefully reviewed his proposed study, and we respectfully request that you release 40 publications to the University of Alberta for this research project. The University will safeguard these documents and return them to you upon completion of the research. Of course, we also offer to provide your office with a copy of the thesis upon its completion.

The publications we require from your listing include:

RR 85-2
TB 68-4
TN 5/82
TN 1/84
TN 19/84
TN 20/84
TN 8/85
TN 10/85
TN 15/85
TN 17/85
TN 19/86
TN 26/86
TN 28/86
TN 5/87
TR 70-2
TR 72-8
TR 74-2
TR 74-5
TR 75-2
TR 75-4
TR 75-5
TR 75-6
TR 76-3
TR 77-2
TR 77-4
TR 79-5
TR 82-1
TR 82-2
WP 76-5
WP 80-1
WP 80-4
WP 80-13
WP 87-1

Also the following conference papers:

Hamel, C. Canadian Forces socio-demographic trends information system.

Lyon, C.D.F. The relationship between job performance and voluntary attrition in the CF.

Pelletier, J.D.P. The Canadian Forces career information system.

Pinch, F.C. Educational change and military adaptation in Canada.

Rampton, G.M. Recruting shortfalls and personnel policies within the Canadian content.

Rampton, G.M. and Cotton, C.A. Military manpower trends in Canada: attrition, widening the manpower bases and other perspectives.

Wenek, K.W.J. Quality of Canadian Forces other rank recruits.

We anticipate receiving these documents by return mail. Without your assistance in providing access to these documents, this research thesis could not be completed at the University of Alberta. Thank you so much for your cooperation in this matter.

Cordially,

AG Konrad

Abram G. Konrad
Professor and Chair

AGK;lf
Enclosure

c.c. Leslie Champ ✓

APPENDIX B

Response letter from Commander Wilson to Dr. Konrad releasing requested publications.

National Defence Défense nationale

2900-1 (UAD)

Canadian Forces Personnel
Applied Research Unit
Suite 600
4900 Yonge Street
Willowdale, Ontario
M2N 6B7

10 January 1992

Professor A.G. Konrad
Adult Career and Technology Education
Faculty of Education
University of Alberta
633 Education South
Edmonton, Alberta
T6G 2G5

Dear Professor Konrad:

Enclosed are copies of the publications you requested in your letter dated November 18, 1991. However, as explained by Major Mendes during your telephone conversation, providing such a large and diverse number of documents places a strain on our limited printing resource budget. Nevertheless, we are interested in providing literature support to Mr. Champ's work and have therefore attempted to send you most of the requested material.

As stated in your letter, we appreciate the University of Alberta's offer to safeguard the enclosed material and return it upon completion of the research. Also, a copy of Mr. Champ's thesis for the CFPARU library would be greatly appreciated.

Yours truly,

F.P. Wilson

F.P. Wilson
Commander
Commanding Officer

Enclosures: 42

Canada

APPENDIX C

Release conditions stamped on the inside cover of each CFPARU publication.

"RELEASE CONDITIONS

This information is furnished to Leslie Champ with the express understanding that:

a. It is for the use of the recipients only in performance of the requirement for which it was requested, and shall not be made available to other persons without the written authority of the Department of National Defence, Canada;

b. It shall be given adequate protection to prevent disclosure to other persons; and

c. Improper or unauthorized disclosure of this information may constitute an offence under the Official Secrets Act."

By L Baitin Sgt Date 10 Jan 92

APPENDIX D

Selected Canadian Armed Forces specification sheets for military occupations which are representative of numeric clusters.

FIELD ENGINEER (041)

BASIC TRADE TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (APPROX.)
Canadian Forces School of Administration and Logistics (CFSAL)	Borden, Ont	Basic driver training.	2 weeks
Canadian Forces School of Military Engineering	Chilliwack, BC	Basic skills required for the trade, including construction procedures for: – field defences and obstacles – roads, airfields and helicopter landing sites – a combat water point – Radio communication – Basic military organization, mathematics, military writing, military history, and personal camouflage – Operation of troop weapons, section defensive tasks and procedures, and camouflage of section positions – The use and care of section tools and safety equipment – Basic procedures for rigging, mine laying, booby trapping, firing of explosive charges. – Construction of rafts and bridges	17 weeks

Advanced Trade and Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake advanced trade training through formal courses or on-the-job training as they progress in their careers. Specialty training may also be available. Below are examples of training related to this trade.

Advanced Trade Training	Specialty Training Courses
Carpenter	Combat Diving
Field Operators – Radio Communications	Parachutist
Water Supply-Advanced	Soils Analyst

Career Opportunities

Opportunities for career progression, promotion and advanced training are good for qualified tradesmen.

There are approximately 1000 men in the trade with approximately thirty per cent (30%) holding the rank of MCpl or higher.

Related Civilian Jobs

Highway Construction Foreman
Blaster (Construction)
Carpenter (Rough)
Heavy Equipment Operator
Construction Engineering Technologist
Construction Millwright

RIA 0041-83E

AIR TRAFFIC CONTROL ASSISTANT (162)

BASIC TRADE TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (Approx.)
Canadian Forces School of Administration & Logistics	Borden, Ont	Basic Driver Training	2 weeks
A Canadian Forces Base with flying operations	Various locations	Familiarization and on-the-job training	4 weeks
Canadian Forces Air Traffic Control Training Unit	Cornwall, Ont	Basic trade skills including: – operation of ATC consoles – radiotelephony (R/T) and ATC communications – aircraft movement and control messages and reports – flight planning and airfield services – navigation and approach aids – aviation weather reports and forecasts – alerting procedures for emergency and overdue aircraft – radio direction finding	9 weeks

Advanced Trade and Specialty Training Courses

Personnel who demonstrate the required ability and amibition will undertake advanced trade training through formal courses or on-the-job training as they progress in their careers. Specialty training may also be available. Below are examples of training related to this trade.

Advanced Trade Training

Airport Managment
Search and Rescue Coordination
Flight Safety

Specialty Training Courses

Aeordrome Controller
Radar Controller
TRACS Data Systems Coordinator

Career Opportunities

The Air Traffic Control Career Field is both interesting and demanding. ATCAs have an opportunity for progression to increasingly responsible employment and a very satisfying career. The Air Traffic Control Career Field consists of two trades, the Air Traffic Control Assistant (ATCA) 162 and Air Traffic Controller (AIR T CON) 161. Corporal is the highest rank obtainable in the ATCA 162 trade. Progression to the AIR T CON 161 trade is mandatory for an individual's retention in the Air Traffic Control Career Field and is automatic upon successful completion of the AIR T CON 161 course and unit qualification.

There are approximately 200 personnel in the ATCA trade at this time.

Related Civilian Jobs

Flight Dispatch Clerk
Aerodrome Driver
Airline Ticket Clerk
Controller Assistant – MOT

RADIO TECHNICIAN (221)

BASIC MILITARY OCCUPATION (MOC) TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (Approx)
Canadian Forces School of Communications and Electronics	Kingston, Ont	Basic Occupation Training including: — maintaining telecommunications systems (electronic, electro-mechanical, video, fiber-optic) — maintaining antenna systems — operating power generating systems related to the occupation — operating hand and power tools — performing installation of, and modification to, assigned equipment	49 training days

Advanced Military Occupation and Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake training through formal courses or on-the-job training as they progress in their career. Specialty training may also be available. Below are examples of training related to this military occupation.

Advanced Military Occupation Training

- Mini Computer Data Gen Nova 1200
- Burroughs B4800/B774-4 Message Processor Computer
- AETE PDP11/34 Minicomputer and Peripherals

Specialty Training Courses

- Military Aeronautical Communication System (MACS)
- Microwave Radio Systems (MICROTEL 878FL)
- Instructional Techniques

Career Opportunities

Opportunities for career progression, promotion and advanced training are excellent for qualified applicants. There are approximately 1200 persons currently employed in the Radio Technician military occupation.

Related Civilian Occupations

- Electronics Engineering Technician
- Repairer Radio Communications Equipment
- Electrician Radio
- Radio Repairer
- Radio Equipment Supervisor

VEHICLE TECHNICIAN (411)

BASIC TRADE TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME APPROX
Canadian Forces School of Administration and Logistics	Borden, Ont	Driver Training Course includes: – standard commercial and military pattern vehicles up to 3-ton capacity.	3 weeks

Canadian Forces School of Aerospace and Ordnance Engineering
OR
École techniques des Forces canadiennes
	Borden, Ont
	
	St Jean, Qué
		Vehicle Technician Course – a combination of theory, instruction and practical work including:
		– principles of internal combustion engine operation and related systems,
		– how to strip and rebuild typical engines and components of these vehicular systems.
		– common and special tools and electronic test equipment
		– basic garage hydraulic, mechanical and pneumatic equipment
		– oxy-acetylene welding equipment
		– operation and maintenance of two and four cycle automotive engines
		– automotive cooling, air-intake, carburation, fuel, exhaust, electrical, drive line, brake, frame, steering and suspension systems
		– operation of light tracked vehicles
		– field environment skills including:
		  – tactics
		  – use of firearms
		  – convoy and blackout night driving
			22 weeks

Advanced Trade and Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake advanced trade training through formal courses or on-the-job training as they progress in their careers. Specialty training may also be available. Below are examples of training related to this trade.

Advanced Trade Training	Specialty Training Courses
Non-Destructive Testing Techniques	Instructional Techniques
Rustproofing and Retreatment	Engineering Equipment Maintenance
Vehicle Body Repair	Aircraft and Airfield Ground Equipment Maintenance

Career Opportunities

Opportunities for career progression, promotion and advanced training are average for qualified applicants. There are approximately 2900 persons employed in the Vehicle Technician trade at this time.

Related Civilian Jobs

Industrial Truck Mechanic
Automative Brake and Front-end Mechanic
Truck-Trailer Repairer
Tune-up Specialist
Motor Vehicle Mechanic
Heavy Equipment Mechanic

RIA 0411-83E

METALS TECHNICIAN (561)

BASIC TRADE TRAINING			
SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (Approx)
Canadian Forces School of Aerospace and Ordnance Engineering	Borden, Ont	Basic skills required for the trade including: – shop mathematics – interpretation of mechanical drawings & blue prints – power and hand tools – metallurgy – pattern development – aircraft fasteners – fabrication of aircraft parts – installation of non-permanent fasteners – aircraft sheet metal repair – composite materials (fiberglass, plastics, etc) – manufacture of aircraft tubing – welding	25 weeks

Advanced Trade and Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake advanced trade training through formal courses or on-the-job training as they progress in their careers. Specialty training may also be available. Below are examples of training related to this trade.

Advanced Trade Training

Non-destructive testing
Corrosion detection and control
Damage classification and repair

Specialty Trade Courses

Vehicle Body Repair
Aircraft Structure Repair
Parachutist

Career Opportunities

Opportunities for career progression, advanced training and promotion are good for qualified personnel who can work to the demanding standards required in the trade. There are approximately 450 personnel currently employed in the Mtl Tech trade.

Related Civilian Jobs

Forging Operations
Sheet Metal Worker
Airframe Sub-Assembler
Body Repairman
Plastic Sheet Worker
Boilermaker, Platemaker and Structural Metal Workers

MEDICAL LABORATORY TECHNICIAN (714)

MEDICAL LABORATORY TECHNICIAN (714) SKILLED ENROLLEE PLAN

All applicants who are enrolled must attend and complete a ten week basic training course at either Cornwallis N.S. or at St-Jean, P.Q. before commencing their assigned duties. All direct entry Lab Techs will be granted the rank and salary of an acting Corporal (provisional) for a minimum period of six months. During this time you will be assigned to one of the following Canadian Forces Hospitals (CFH): CFH Cold Lake, Alberta, CFH Valcartier, P.Q., CFH Halifax, NS, or National Defence Medical Center (NDMC) in Ottawa, Can. for familiarization with CF Medical Services laboratory procedures. You will be rotated through each of the laboratory disciplines and you will be constantly observed and assessed. As you are a skilled technician and you have been granted acting corporal rank, your ability to carry out your duties on your own while on call will also be scrutinized and assessed. Upon completing your six month provisional period a special performance evaluation report (PER) will be made and provided you have earned a favourable PER, substantive Corporal rank will be awarded.

BASIC TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (APPROX)
Canadian Forces Recruit School (CFRS)	Cornwallis Nova Scotia	— Introduction to Military Life and Customs — Drill — Physical fitness — Classroom instruction about the CF and its many roles	50 training days
or			
École de recrues des Forces canadiennes (ERFC)	St-Jean Quebec		

Advanced Training and MOC Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake advanced Military Occupation (MOC) training through formal courses as they progress in their career. Specialty training may also be available.

Advanced MOC Training	Specialty MOC Courses
— Blood Coagulation Studies	— Biochemistry Laboratory Supervisor
— Clinical Cateriological Techniques	— Advanced Biochemical Techniques
— Advanced Immunohematological Procedures	— Basic Medical Equipment Maintenance
— Advanced Mycological Techniques	— Advanced Equipment Maintenance
— Specialized Histopatholocial Techniques	
— Advanced Hematological Procedures	
— Advanced Parasitological Procedures	
— Advanced Serological Techniques	

Career Opportunities

Personnel who demonstrate potential and maintain a high performance level may be selected for subsidized university training to a baccalaureate level in medical laboratory science. At senior qualification levels selected personnel may qualify as medical associate officers within the Canadian Forces Medical Services. There are approximately 90 personnel currently employed in the Canadian Forces as Medical Laboratory Technicians.

Related Civilian Jobs

- Biochemistry Technologist
- Histology Technologist
- Microbiology Technologist
- Medical Laboratory Technician
- Morgue Assistant
- Cytotechnologist
- Medical Laboratory Technologist
- Laboratory Technologist, Veterinarian
- Infection Control Officer
- Clinic Assistant

RIA 0714-87E

COOK (861)

BASIC TRADE TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (Approx.)
Canadian Forces School of Administration and Logistics	Borden, Ont	– Cookery terms, weights and measures – Basic baking and butchering – Small and large quantity cooking – Field cooking – Food handling/hygiene – Ration accounting – Fire and safety precautions – Inventory control	17 weeks

Advanced Trade and Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake advanced trade training through formal courses or on-the-job training as they progress in their careers. Specialty training may also be available. Below are examples of training related to this trade.

Advanced Trade Training

Advanced Bake Shop
Kitchen Design and Layout
Buffet Decoration

Specialty Training Courses

Hospital Food Services
Instructional Technique
Sea Environmental Training

Career Opportunities

Career progression, promotion and advanced courses are readily available for personnel with proven abilities. Approximately 50% of all Cooks are employed in bases and stations, the remainder serve with land based operational units or on board ships at sea. Travel opportunities are extensive. Female Cooks do not go to sea or serve with field combat units.

There are approximately 1650 personnel currently serving in this trade.

Related Civilian Jobs

Short order, institutional or restaurant cook
Baker
Food Services Instructor in high school or colleges
Butcher
Supervisor (Food Service Establishment)

RIA 0861-83E

SUPPLY TECHNICIAN (911)

BASIC TRADE TRAINING

SCHOOL	LOCATION	SUBJECTS	TRAINING TIME (Approx)
Canadian Forces School of Administration and Logistics (CFSAL)	Borden, Ont	Basic skills required for the trade including: – stocktaking – supply operations – material identification – preparation of requisitions – warehouse stock location system – use of materiel handling aids – military correspondence – processing issues and receipts – computer operation and maintenance – loan procedures – preservation and packaging of materiel – ration accounting – Canadian Forces publication system – serially numbered materiel control and accounting – inventory control	7 weeks

Advanced Trade and Specialty Training Courses

Personnel who demonstrate the required ability and ambition will undertake advanced trade training through formal courses or on-the-job training as they progress in their careers. Specialty training may also be available. Below are examples of training related to this trade.

Advanced Trade Training	Specialty Training Courses
Military Contracts	Packaging Technician
Internal Audit Procedures	Instructional Technique
Personnel Management	Sea Environmental Training

Career Opportunities

Qualified personnel may have opportunities to serve with static and field units virtually anywhere in the world that the Canadian Forces serve. Supply Techs represent one of the largest trade groups in the Canadian Forces. Career progression and a variety of employment are readily available to personnel with proven abilities.

There are approximately, 4,000 members currently employed in this trade.

Related Civilian Jobs

Storesman
Contracts Administrator
Purchasing Officer
Warehouse Manager
Truck or Forklift Driver

APPENDIX E

Trade Brief for Military Occupation Trade: Radar Plotter 271.

RADAR PLOTTER

271

1. The Operations Department is broken down into three trades. These are the Radar Plotter (RDR PLTR), Signalman Sea (SIG SEA) and the Radioman Sea (RAD SEA) trades. The RDR PLTR spends the majority of his time in the Operations Room of the ship or submarine, operating radars and plotting all types of action information, as well as maintaining the equipment he operates. The RAD SEA and SIG SEA trades split the external information gathering and distribution. The RAD SEA is responsible for radio communications, teletype and cryptographic direction finding and electronic warfare equipment. The SIG SEA, on the other hand, is involved with visual signalling, message processing, and interpreting operational, maneuvering and tactical signals and messages. The SIG SEA and RAD SEA work very closely together and it is often hard to draw a line between where one trade finishes and the other begins.

DUTIES AND RESPONSIBILITIES

3. Now let us look into the Radar Plotter trade in more depth. We know that the Radar Plotter displays information in a clear manner in order to aid in the task of decision making. But where does the information come from and how does he display it?

5. He is also responsible for operating all types of warning and navigational radar, displays, and associated

equipment. As well, at the Leading Seaman level, he maintains, modifies, installs and repairs this equipment and electronic navigational aid equipment.

6. His duties at sea will not, however, be confined solely to those of the Operations Room. He will have to assist in the cleaning and maintenance duties on board ship, in addition to general seamanship work such as boatwork and replenishment at sea. In addition, the cleaning and maintenance duties must be done in addition to standing watches to safeguard the ship from fire, flood and other emergencies. All this, however, is very much a necessity to become a good seaman and Radar Plotter tradesman.

TRAINING

8. On completion of 11 weeks of Basic Recruit Training at Cornwallis, N.S., the serviceman is sent to the Fleet School in Halifax, N.S. where he will be given a four week course in Sea Environmental Training. There he learns firefighting, ship terminology, splicing, knot-tying, and so on. On completion of that, he goes on the Operations Division of the Fleet School to take his first formal course as a Radar Plotter Trade Level 3 (TL3). This course is available in either French or English and lasts for approximately eight weeks. 9. The course is broken into two phases, the Radar phase and the Combat Information phase. The first phase comprises approximately one third of the course and consists of instruction in the theory and operation of radars and radar displays, accurately reporting helicopter contacts on

radar, understanding the meaning and use of various radar states, correctly operating the plotting tables, and performing preventive maintenance of a minor nature. The remainder of the course deals with various other duties not related to radar. The Radar Plotter Trade Level 3 will be taught the functions of a ship's Combat Information Team and the duties of its members, the sources of Combat Information (both internal and external), the various types of internal communications and the correct procedures for their use, the meaning of operational code words, the types of information found on the different plots in the Operations Room and how it is to be correctly plotted, and the use and maintenance of state boards. 10. Progression in the Radar Plotter Trade is from Ordinary Seaman to Leading Seaman. At the 30 month point in the man's career, he will undergo his second formal trades courses, the Trade Level 4 course at Halifax or Victoria. The course is approximately 17 weeks and is designed to develop and increase the skills gained at sea. Upon promotion to Leading Seaman, he will then be considered for the Technician Qualifying Course. Selection for this course is based on performance and merit and the man's display of technical ability during his training as a Pay Level 4. After this 14 month Technician course, he will graduate as a Radar Technician Sea. Progression in rank is then based on merit and performance from Leading Seaman to the rank of Chief Petty Officer 1st Class.

16. The Radar Plotter now, and in the future, experience a career which provides him with companionship, good pay, travel, solid training for future and more responsible positions, a continuing learning experience, and, above all, job satisfaction.

Wilson, F. P. & Flynn, J. A. (1982). **Introduction of Trade and Lifestyle Videotapes (TLVs) Into a Canadian Forces Vocational Counselling Setting.** pp. 64-70.